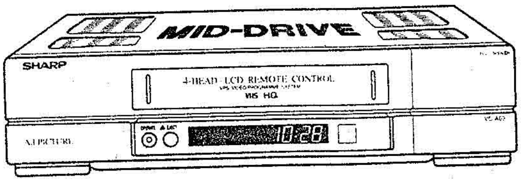
SHARP

SERVICE MANUAL
SERVICE-ANLEITUNG

S01M9VC-A63GM



VHS VIDEO CASSETTE RECORDER
VHS VIDEO-CASSETTEN-RECORDER

MODEL MODELL VC-A63GM(GY)

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

Im Interesse der Benutzer-Sicherheit (gemäß den Sicherheitsvorschriften in einigen Ländern) sollte dieses Gerät wieder auf seinen ursprünglichen Zustand eingestellt und nur die vorgeschriebenen Teile verwendet werden.

CONTENTS

Page
- SPECIFICATIONS 2
- DISASSEMBLY AND REASSEMBLY 3
- FUNCTION OF MAJOR MECHANICAL PARTS 4
- ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS 6
- ADJUSTMENT OF THE ELECTRICAL CIRCUITRY 32
- MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE 41
- REPLACEMENT OF TIMER IC5003 63
- BLOCKDIAGRAMS 129
- WAVEFORMS 143
- SIGNAL FLOW SYMBOLS AT A GLANCE 145
- SCHEMATIC DIAGRAMS 146
- WIRING SIDE PWBs 165
- REPLACEMENT PARTS LIST 169
- EXPLODED VIEWS 188
- PACKING OF THE SET 193

INHALT

Seite
- TECHNISCHE DATEN 2
- AUSBAU UND WIEDERZUSAMMENBAU 65
- FUNKTIONEN DER WICHTIGSTEN MECHANISCHEN TEILE 66
- EINSTELLUNG, ERNEUERUNG UND MONTAGE DER MECHANISCHEN TEILE 68
- EINSTELLUNG DER ELEKTRISCHEN SCHALTKREISE 95
- MECHANISMUSBEDIENUNGS-ABLAUFPLAN UND FEHLERSUCHTABELLE 104
- AUSWECHSELN DES TIMER IC5003 128
- BLOCKSCHALTBILDEN 129
- WELLENFORMEN 143
- SIGNAL FLUSSYMBOLE AUF EINEN BLICK 145
- SCHEMATISCHER SCHALTPLÄNE 146
- LEITERPLATTENSEITEN 165
- ERSATZTEILLISTE 169
- EXPLOSIONSDARSTELLUNGEN 188
- VERPACKUNG DES GERÄTES 193

SHARP CORPORATION

SPECIFICATIONS

Format:	VHS PAL standard
Video recording: system	Two rotary heads, helical scan system
Video signals:	PAL/SECAM colour and B/G signals, 625 lines
Recording/playing: time	4 hours max. with SHARP E-240 tape (SP) 8 hours max. with SHARP E-240 tape (LP)
Tape width:	12.7 mm
Tape speed:	23.39 mm/sec. (SP) 11.70 mm/sec. (LP)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF channel S1 – S41/E 2 – E12 UHF channel E21 – E69
RF converter output: signal	UHF channel E30 – E39 (adjustable). Preset to CH E36
Power requirement:	AC 230 V, 50 Hz
Power consumption:	Approx. 19 W
Operating temperature:	5°C to 40°C
Storage temperature:	– 20°C to 60°C
Weight:	4.8 kg
Dimensions:	380 mm (W) × 325 mm (D) × 89.8 mm (H)
Video	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
Audio	0 dBs = 0.775 Vrms
Input:	Line: – 3.8 dBs, more than 47 k ohm
Output:	Line: – 3.8 dBs, less than 1 k ohm
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery AC Cord Guarantee Card

*As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169-2) for combined VHF/UHF antenna with 75 ohm connector.

TECHNISCHE DATEN

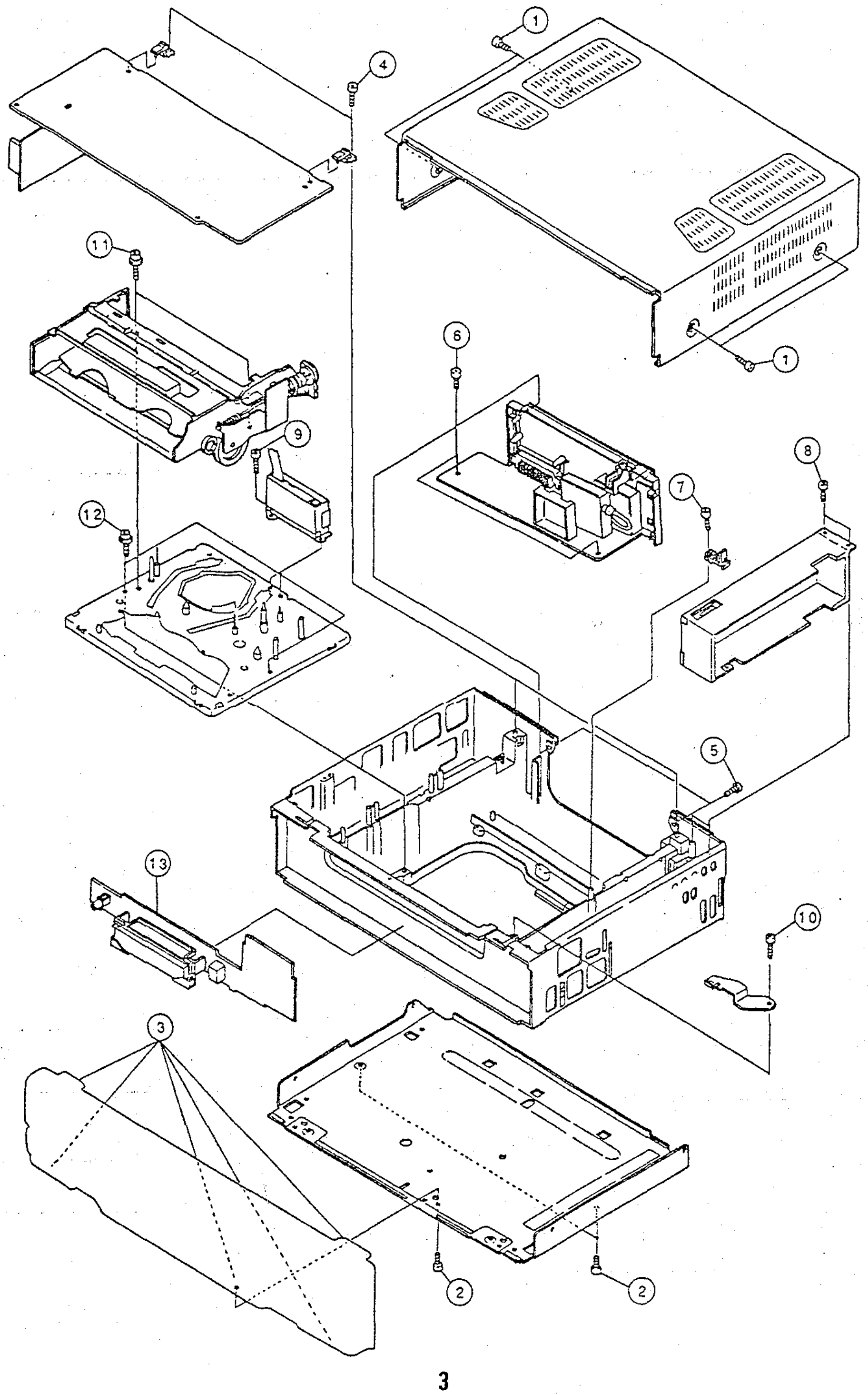
Format:	VHS, Standard
Videoaufnahmesystem:	Zwei rotierende Köpfe, Schrägspurabtastung
Videosignale:	PAL/SECAM-Farb-und B/G-weißsignale, 625 Zeilen
Aufzeichnungs-/: Wiedergabezeit	4 Stunden maximal mit E240-Band von SHARP (SP) 8 Stunden maximal mit E-240-Band von SHARP (LP)
Bandbreite:	12,7 mm
Bandgeschwinddigkeit:	23,39 mm/s. (SP) 11,70 mm/s. (LP)
Antenne:	75 Ohm unsymmetrisch
Empfangskanäle:	VHF-Kanal S1 – S41/E2 – E12 UHF-Kanal E21 – E69
HF-Wandler-: Ausgangssignal	UHF-Kanal E30 – E39 (einstellbar), voreingestellt auf Kanal E36
Stromversorgung:	Wechselstrom 230 V, 50 Hz
Leistungsaufnahme:	Ca. 19 W
Betriebstemperatur:	5° bis 40°C
Legerungstemperatur:	– 20° bis 60°C
Gewicht:	4,8 kg
Abmessungen:	380 (B) × 325 (T) × 89,8 (H) mm
Video	
Eingang:	1,0 Vss, 75 Ohm
Ausgang:	1,0 Vss, 75 Ohm
Audio	0 dBs = 0,775 Veff.
Eingang:	Direkteingang: – 3,8 dBs, mehr als 47 k Ohm
Ausgang:	Direktausgang: – 3,8 dBs, weniger als 1 k Ohm
Mitgeliefertes: Zubehör	75 Ohm-Koaxialkabel Bedienungsanleitung Infrarotfernbedienung Batterie Netzkabel Garantie karte

*Im Sinne der ständi-gen Verbesserung behalten wir uns das Recht vor, die äußere Aufmachung und tech-nischen Daten ohne Vorankündigung zu ändern.

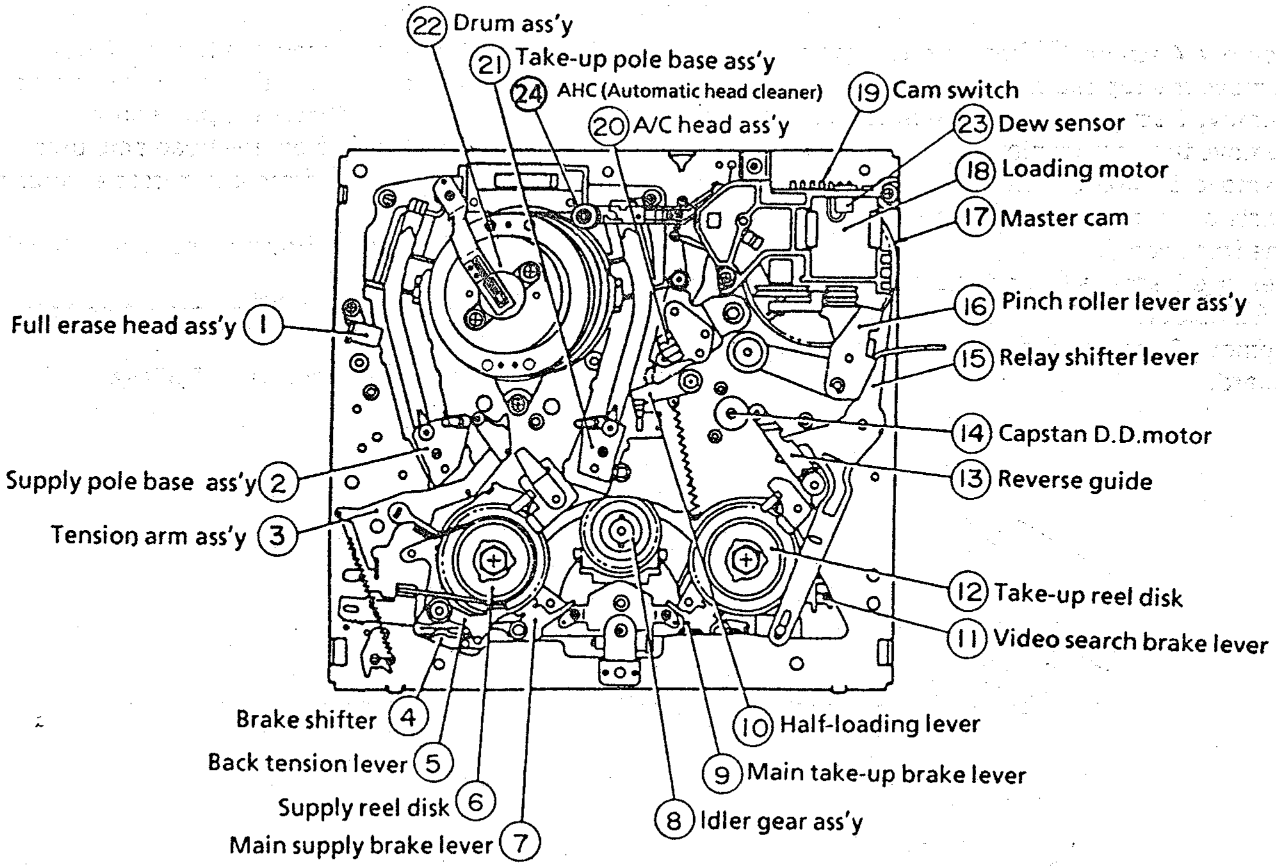
Zur Beachtung: Die Antenne muß der neuen DIN-Norm 45325 (IEC 169-2) für VHF/UHF-Kombiantennen mit 75 Ohm-Anschluß entsprechen.

DISASSEMBLY AND REASSEMBLY

1. Remove 4 screws ① from the top cabinet, and remove the top cabinet by sliding it backward.
2. Remove 3 screws ② from the bottom plate, and remove the bottom plate by sliding it backward.
3. Remove 5 clips ③ from the upper and lower parts of front panel, respectively, and remove the front panel.
4. Remove 2 screws ④ and the clip from the main PWB holder.
5. Remove 2 screws ⑤ from the antenna terminal board.
6. Remove 2 screws ⑥ from the tuner IF PWB.
7. Remove 1 screw ⑦ from the power unit holder.
8. Remove 2 screws ⑧ from the power unit.
9. Remove 2 screws ⑨ from the head amp unit.
10. Remove 1 screw ⑩ from the cassette housing control assembly.
11. Remove 2 cassette housing control assembly mounting screws ⑪.
12. Remove 3 mechanism chassis mounting screws ⑫.
13. Remove 2 clips from the timer PWB ⑬.

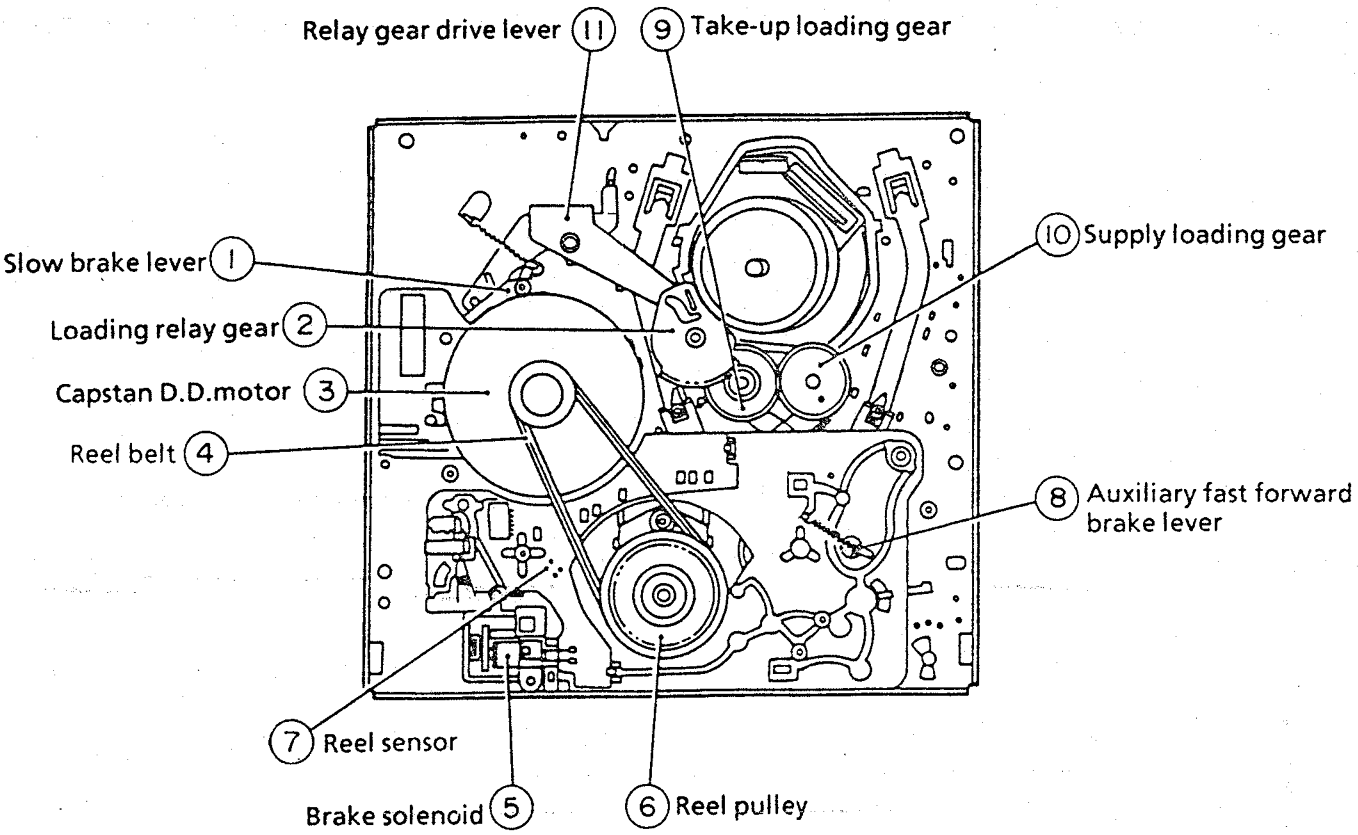


FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)


㉒ Drum ass'y
㉑ Take-up pole base ass'y
㉔ AHC (Automatic head cleaner)
⑳ A/C head ass'y
⑲ Cam switch
㉓ Dew sensor
⑱ Loading motor
⑰ Master cam
⑯ Pinch roller lever ass'y
⑮ Relay shifter lever
⑭ Capstan D.D.motor
⑬ Reverse guide
⑫ Take-up reel disk
⑪ Video search brake lever
⑩ Half-loading lever
⑨ Main take-up brake lever
⑧ Idler gear ass'y
Full erase head ass'y ①
Supply pole base ass'y ②
Tension arm ass'y ③
Brake shifter ④
Back tension lever ⑤
Supply reel disk ⑥
Main supply brake lever ⑦

No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.
4.	Brake shifter Set the position of brake or the like in accordance with the modes such as stop and playback.
5.	Back tension lever Brakes the supply reel disk to a certain degree to prevent tape slackening during "half-loading", "loading" and "shifting from playback to video search rewind".
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.
10.	Half-loading lever Bring the tape in contact with the A/C head, putting it in half-loading state in the fast forward or rewind mode.
11.	Video search brake lever It is in contact with the take-up reel disk normally, and brakes it to a certain degree. It applies larger brake in the video search rewind mode.
13.	Reverse guide Pulls out the tape in the video search rewind mode, and controls the tape drive train height with the upper and lower guides.
15.	Relay shifter lever Transmits the operation of the master cam to the brake shifter, and operates the reverse guide.
16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject the tape.
17.	Master cam Turns clockwise during loading, and counterclockwise during unloading, and moves the shifter or the like in accordance with each mode.
18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly via the belt.
19.	Cam switch Rotates synchronously with the master cam, and detects the position of each mode by means of the internal switch.
23.	Dew sensor An element which detects condensation inside the unit. This element is activated, when it senses condensation, to interrupt the mechanism.

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)


Relay gear drive lever ⑪
⑨ Take-up loading gear
⑩ Supply loading gear
Slow brake lever ①
Loading relay gear ②
Capstan D.D.motor ③
Reel belt ④
⑧ Auxiliary fast forward brake lever
⑦ Reel sensor
Brake solenoid ⑤
⑥ Reel pulley

No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	7.	Reel sensor An element which sheds the light onto the reflection plate affixed to the bottom side of the reel disk, and detects the rotation of the reel disk through receiving the reflected light.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the reel belt.	8.	Auxiliary fast forward brake lever Brakes the supply reel disk to a certain degree in the fast forward and rewind modes.
4.	Reel belt Transmits the power to run the tape to the reel pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.
5.	Brake solenoid Adsorbs and holds the brake shifter in the fast forward and rewind modes, and releases it in the stop mode.	10.	Supply loading gear Shifts the supply pole base and guide roller via the take-up loading gear, and applies the tape around the drum assembly.
6.	Reel pulley Transmits the power of the capstan D.D. motor to the reel disk via the reel idler.	11.	Relay gear drive lever Transmits the movement of the master cam to the take-up loading gear via the loading relay gear.

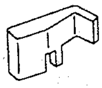
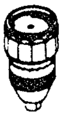
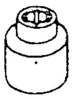
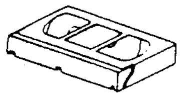
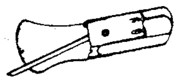
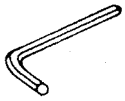
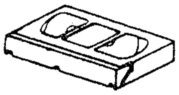
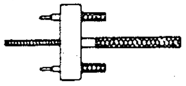
ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

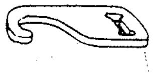
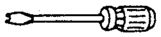
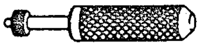
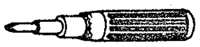
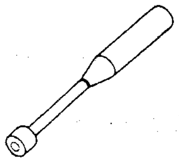
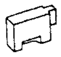
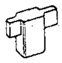
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-F18	BU		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VROCPSV	CK		These tapes are especially used for electrical fine adjustment.
	Alignment Tape (PAL·LP)	VROUBZFS	BP		
10	Drum Replacing Jig	JiGDT-0001	BG		This is used for replacement of the VCR's upper drum.

No.	Jig Item	Part No.	Code	Configuration	Remarks
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting Jig.
12	Special Bladed Screwdriver	JiGDRiVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
13	Tension Band and Plate Adjusting Jig	JiGDRiVER-6	BM		This Jig is used for adjusting the tension band and tension plate.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
15	Box Driver	JiGDRiVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JiGDRiVER110-4	AV		This Jig is used for height adjustment of the retaining guide.
16	Retaining Guide Height Adjusting Jig	JiGGH-F18	BU		This Jig is used for height adjustment of the retaining guide.
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts / Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	3000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	□	□	□	□	□	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller	□	□	□	□	□		
Supply impedance roller (inner hole and shaft)		□		□	□		Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange	□	□	□	□	□		Clean tape contact part with the specified cleaning liquid.
Retaining guide	□	□	□	□	□		
Slant pole	□	□	□	□	□		
Video head	□	○□	□	○□	○□	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head	□	□	□	□	□	Poor colour, beating	
A/C head	□	□	□	□	□	Sound too small or distorted	
Capstan D.D. Motor	□	□	□	□	○	No tape running, uneven colour	
Pinch roller	□	□	□	□	○	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		○	□	No tape running, tape slack, no fast forward/rewind motion	
Loading belt		□		○	□	Cassette not loaded or unloaded	
Cassette loading belt		□		○	□		
Tension band ass'y					○	Lateral image swing	
Loading Motor					○	Cassette not loaded or unloaded	
AHC (Automatic Head Cleaner)		○		○	○		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.
Reel block*						See the chart below.	
***See the table below for servicing the reel block parts.**							
Supply/Take-up reel disks		□△		△○	□△	No tape running, tape slack	Clean with pure high quality isopropyl alcohol.
Video search brake lever				○			
Idler gear ass'y				○		No tape running	
Reel Pulley		□△		□○	□△		
Main supply/take-up brake levers				○		Tape slack	

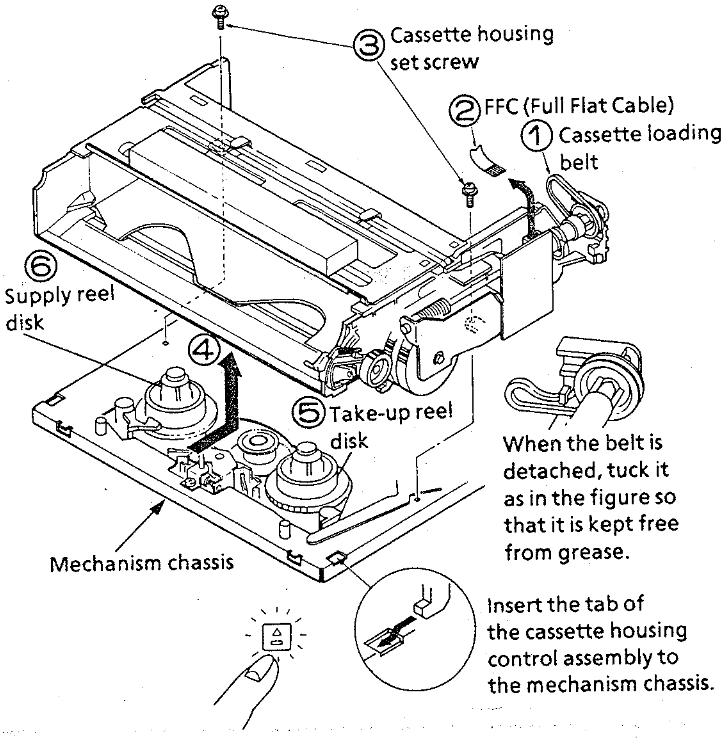
NOTE:
○: Part replacement.
□: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

- **Removal**

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
   a) Remove the cassette loading belt ①.
   b) Disconnect the FFC (Full Flat Cable) ②.
   c) Remove the cassette housing installation screws ③.
   d) Slide and pull out the cassette housing control assembly ④ upward.



③ Cassette housing set screw
② FFC (Full Flat Cable)
① Cassette loading belt
⑥ Supply reel disk
④
⑤ Take-up reel disk
Mechanism chassis

When the belt is detached, tuck it as in the figure so that it is kept free from grease.

Insert the tab of the cassette housing control assembly to the mechanism chassis.

Figure 1-1.

- **Reassembly**

1. Before installation of the cassette housing control assembly, place the unit in the stop mode with the power on, then unplug the power cord. (The main body is placed in the eject mode.)
2. Follow the procedures for removal in the reverse order.

Notes:

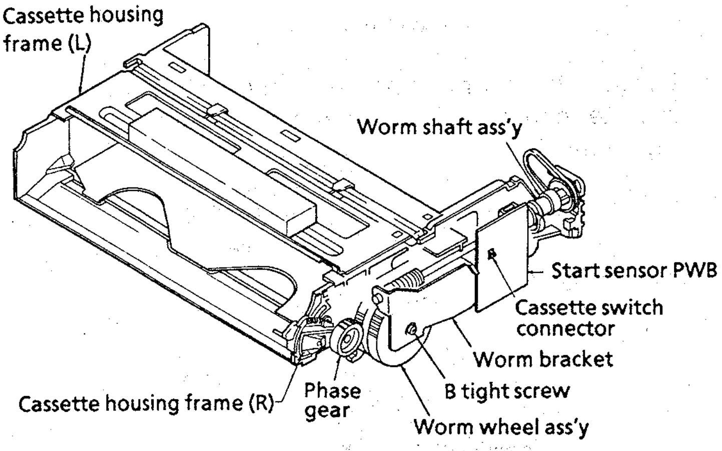
1. Be sure to unplug the power cord in removal and reassembly.
2. Keep the cassette loading belt free from grease. In case of its adhesion, clean the belt.
3. In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.
4. In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.
5. Place the unit in the eject mode in removal or reassembly of the cassette housing control assembly.
6. Load the cassette once onto the cassette housing control assembly after reassembly. (If the cassette housing control assembly normally operates after this, the phases of mechanism and the cassette controller are accurately adjusted after ejection.)

MECHANICAL OPERATION CHECK WITHOUT CASSETTE

When power is on, the general operations of the mechanism can be checked without a cassette. Note the following points.

1. Check video search rewind and rewind, rotating the take-up reel disk ⑤ by hand (in either normal or reverse direction). If it is not rotated, the reel sensor works to shift the mechanism to the eject mode.
2. When the stop button is pressed, the mechanism does not stop at a normal stop position. It shifts to the eject mode and stops.
3. When the stop button is pressed in the playback, video search rewind, and video search forward modes, the supply reel disk ⑥ keeps on rotating for several seconds for elimination of tape slack in the course of shifting to the eject mode. In such a case, rotate the take-up reel disk ⑤ somewhat by hand, and the supply reel disk ⑥ stops, which can reduce the working time.

REPLACEMENT OF WORM WHEEL ASSEMBLY



Cassette housing frame (L)
Worm shaft ass'y
Start sensor PWB
Cassette switch connector
Worm bracket
B tight screw
Worm wheel ass'y
Phase gear
Cassette housing frame (R)

Figure 1-2.

- Removal

1. Unsolder the cassette switch connectors (No. 16, 17) from the start sensor PWB.

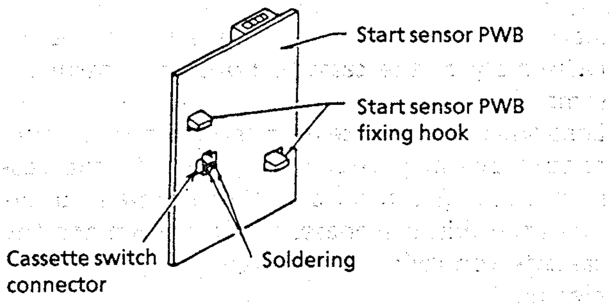

Start sensor PWB
Start sensor PWB fixing hook
Cassette switch connector
Soldering

Figure 1-3.

2. Lift the start sensor PWB pressing the two start sensor PWB fixing hooks inward.

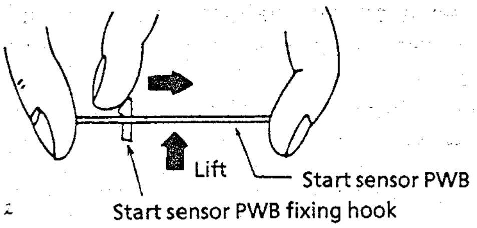

Lift
Start sensor PWB
Start sensor PWB fixing hook

Figure 1-4.

3. Unscrew one B tight screw to detach the worm bracket.
   Note:
   The worm shaft bearing can easily come out of position. So be careful not to lose it.

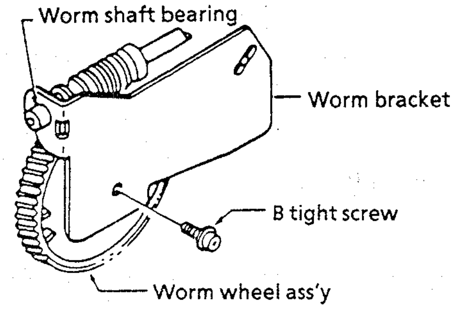

Worm shaft bearing
Worm bracket
B tight screw
Worm wheel ass'y

Figure 1-5.

4. Remove the worm shaft assembly, pulley, and cassette loading belt all from the cassette housing frame (R).

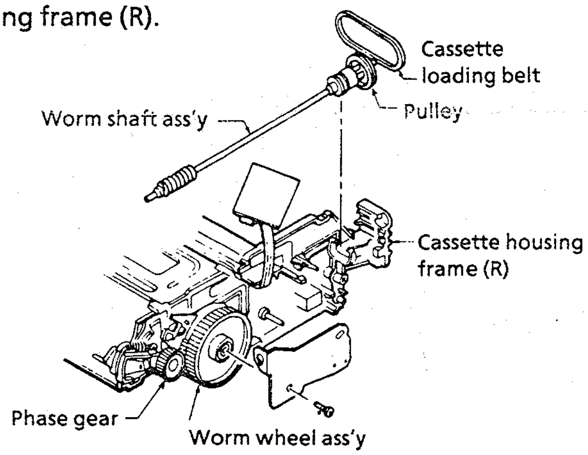

Cassette loading belt
Pulley
Worm shaft ass'y
Cassette housing frame (R)
Phase gear
Worm wheel ass'y

Figure 1-6.

5. Place the slider pin just above the worm wheel assembly (Figure 1-7). (The retainer of the slider is locked at two positions. So unlock it as in the Figure 1-8.)
6. Pull out the worm wheel assembly toward you pressing the switch lever upward. (Figure 1-7)

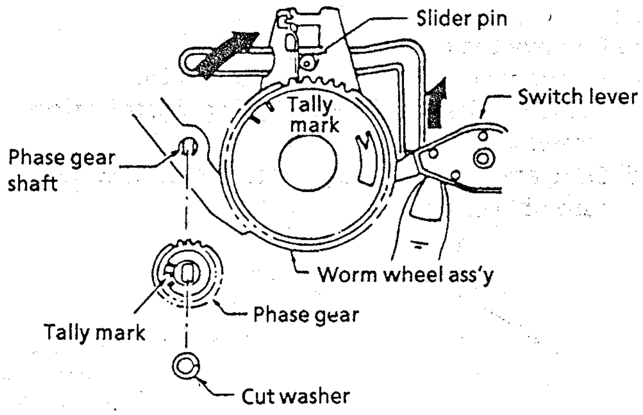

Slider pin
Switch lever
Tally mark
Phase gear shaft
Worm wheel ass'y
Phase gear
Tally mark
Cut washer

Figure 1-7.

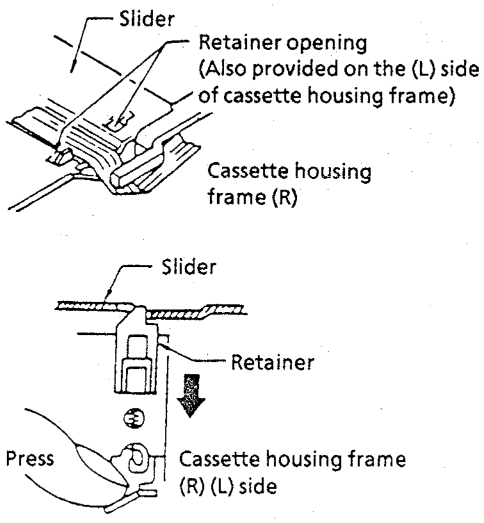
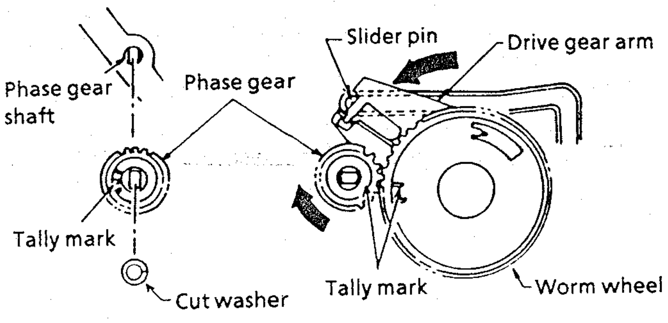

Slider
Retainer opening
(Also provided on the (L) side of cassette housing frame)
Cassette housing frame (R)
Slider
Retainer
Press
Cassette housing frame
(R) (L) side

Figure 1-8.

- **Reassembly**

1. Turn the phase gear clockwise until the slider comes to a halt in the cassette insertion direction. (See the Figure 1-9.)
2. Insert the set up worm wheel gear assembly into the cassette housing frame (R), matching the mark on the phase gear with the mark on the worm wheel gear. Detach the cut washer on the phase gear assembly and the phase gear for easier installation of worm wheel assembly.
   Note:
   Make sure that the slider pin is in the groove of the drive gear arm.


Phase gear shaft
Phase gear
Slider pin
Drive gear arm
Tally mark
Cut washer
Tally mark
Worm wheel

(a) (b)

Figure 1-9.

3. Install the pulley and the cassette loading belt on the worm shaft assembly. Couple the clutch to the clutch lever. And mount them together in the cassette housing frame (R).
   Note:
   Keep in mind that the clutch switching lever should be in the correct position. The mechanism might malfunction if the lever is slightly out of position. (See page 12.)

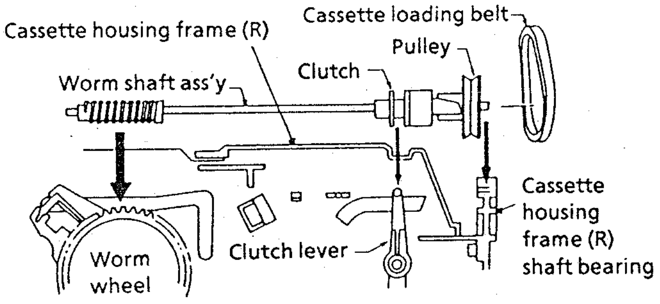

Cassette housing frame (R)
Cassette loading belt
Pulley
Clutch
Worm shaft ass'y
Cassette housing frame (R) shaft bearing
Worm wheel
Clutch lever

Figure 1-10.

4. Attach the worm bracket to the worm shaft assembly. Place them onto the boss on the cassette housing frame (R).
   Note:
   Insert ① before screwing into ② and ③.

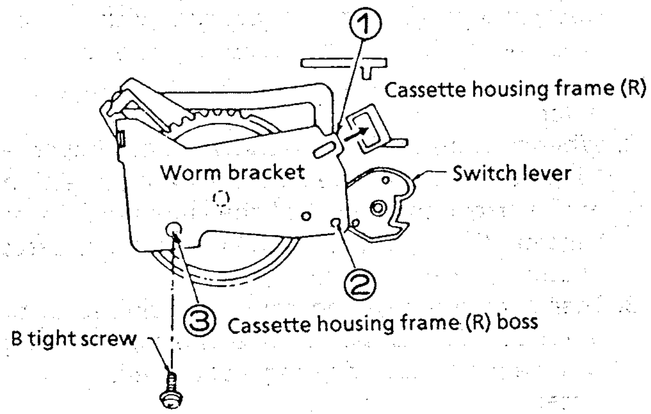
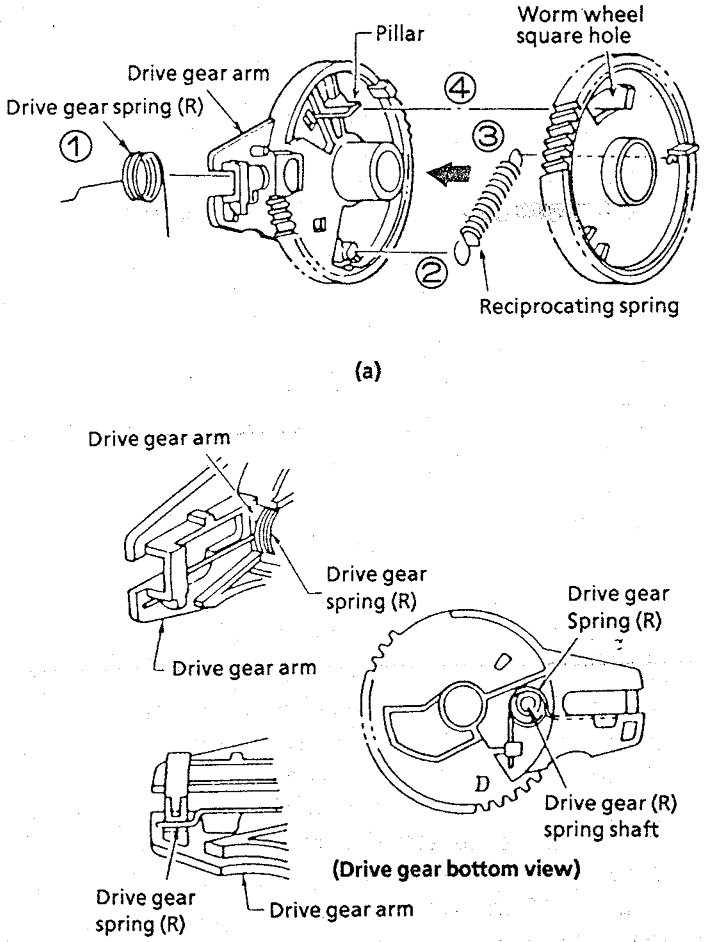

①
Cassette housing frame (R)
Worm bracket
Switch lever
②
③ Cassette housing frame (R) boss
B tight screw

Figure 1-11.

5. Tighten one B tight screw.
   Note:
   Do not overtighten the B tight screw (no more than 5.0 ± 0.5 kg.cm), because the lower threads of the screw hole at the resin-made boss can be broken.
6. Place the start sensor PWB on the cassette housing frame (R).
   Note:
   Check that the switch connectors (No. 16, 17) are in the cassette switch mounting hole.
7. Finally resolder the cassette switch connector to the start sensor PWB.

REASSEMBLY OF DRIVE GEAR


Pillar
Worm wheel square hole
Drive gear arm
Drive gear spring (R)
①
④
③
②
Reciprocating spring
Drive gear arm
Drive gear spring (R)
Drive gear arm
Drive gear Spring (R)
Drive gear (R) spring shaft
(Drive gear bottom view)
Drive gear spring (R)
Drive gear arm

(a)

(b)

Figure 1-12.

1. Pass the tip of the drive gear spring (R) ① through the square hole of the drive gear (R) to hook the spring in position.
2. Hook one end ② of the reciprocating spring to the catch of the drive gear (R).
3. Hook the other end ③ of the reciprocating spring to the catch of the worm wheel.
4. Insert the pillar ④ of the drive gear (R) into the square hole of the worm wheel. Turn the worm wheel somewhat counterclockwise for insertion of the worm wheel to the drive gear (R), because the reciprocating spring is at work.

REPLACEMENT OF CASSETTE LOADING BELT

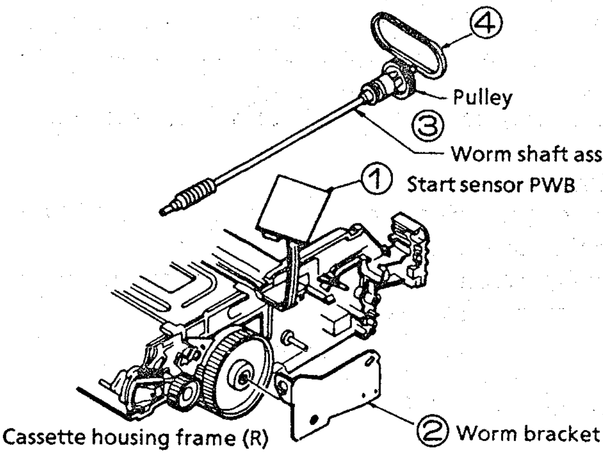

④
Pulley
③
Worm shaft ass'y
① Start sensor PWB
Cassette housing frame (R)
② Worm bracket

Figure 1-13.

1. Remove the start sensor PWB ① and worm bracket ② from the cassette housing frame (R).
2. Remove the worm shaft assembly ③.
3. Replace the cassette loading belt ④ with a new one.

Notes:

1. Do not overtighten the B tight screw which holds the worm bracket in position. The specified torque is 5.0 ± 0.5 kg.cm.
2. Make sure that the cassette loading belt is free from grease. If stained with grease, clean the belt with the cleaning liquid.
3. Perform checking of the clutch switch lever for proper action.

CHECKING THE CLUTCH SWITCH LEVER

- **Checking**

Place the mechanism in the cassette eject mode when removing and attaching the cassette housing from and to the mechanism chassis.

Make sure enough that each part in the cassette housing such as the clutch switch lever is in position. If not, it causes malfunction.

Note:

Figure 1-14 shows the position of each part in the cassette eject mode.

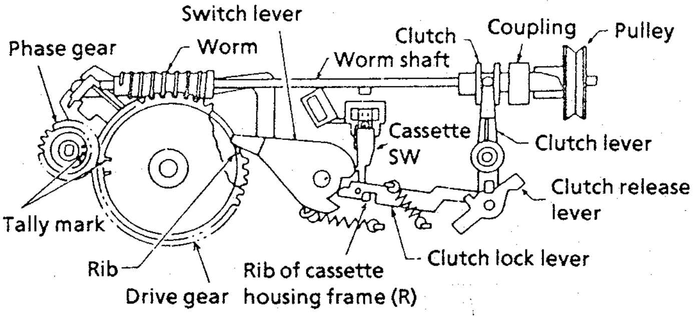
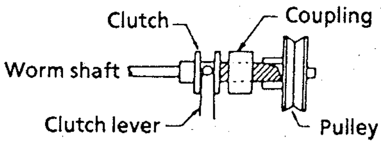

Switch lever
Phase gear
Worm
Clutch
Coupling
Pulley
Worm shaft
Cassette SW
Clutch lever
Clutch release lever
Tally mark
Clutch lock lever
Rib
Rib of cassette housing frame (R)
Drive gear

Figure 1-14.

1. First make sure that the tip of the switch lever is held at the rib of the drive gear (R).
2. Check that the rib of the cassette housing frame (R) and the concavity of the clutch lock lever are engaged.
3. Finally be sure that the relationship between the clutch lever and the clutch, as well as between the clutch and the pulley, are correct as in the Figure 1-15.


Clutch
Coupling
Worm shaft
Clutch lever
Pulley

Check that the clutch is engaged with the pulley through the coupling.

Figure 1-15.

- **Resetting**

Take the following steps to reset the clutch if it is unlocked or if the switch lever and the clutch lock lever are unlocked.

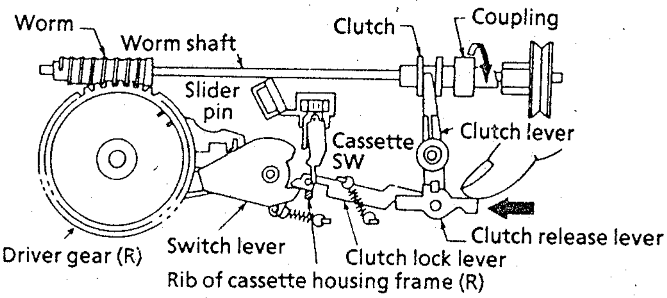

Worm
Worm shaft
Clutch
Coupling
Slider pin
Cassette SW
Clutch lever
Clutch release lever
Driver gear (R)
Switch lever
Clutch lock lever
Rib of cassette housing frame (R)

Figure 1-16.

1. Shift the slider by turning the coupling in the arrow direction (clockwise) until the slider pin is at the bottom of the slider groove as shown in the Figure 1-16. (The loading mode)

   Note:

   Note that the slider is equipped with a lock mechanism. Unlock the locks on cassette housing frames (L) and (R) side before shifting the slider.
2. When the position is set as shown in the Figure 1-16, push the clutch release lever in the direction of the arrow by hand until the clutch lock lever becomes tightly locked by the rib of the cassette housing frame (R).
3. Then turn the coupling counterclockwise until the slider reaches the cassette insertion opening and the reciprocating spring is activated.

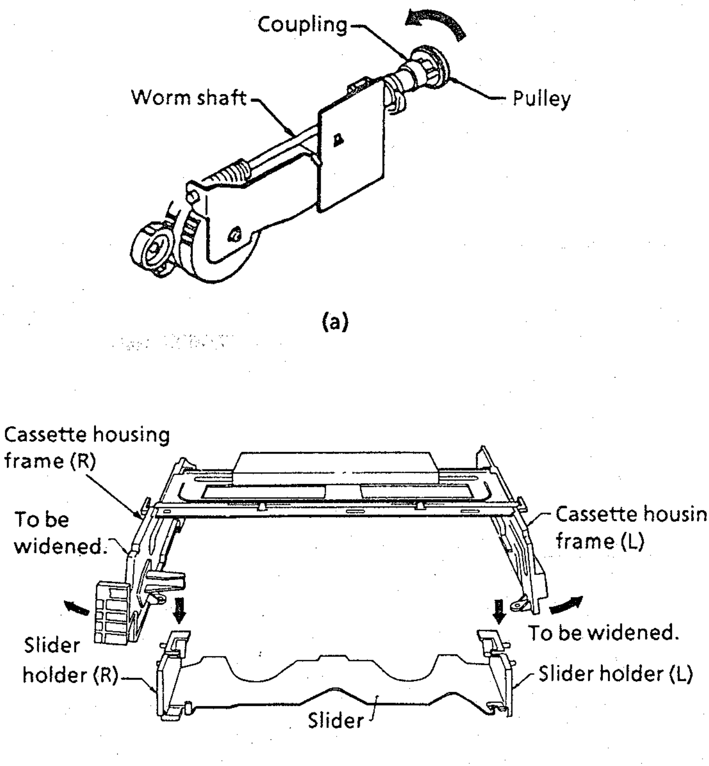
   Note:

   There is no need to unlock the slider when shifting the slider to the cassette insertion opening. Just keep shifting the slider.

REPLACEMENT OF LOCK RELEASE LEVER

- **Removal**

1. Place the slider in the cassette down position. (Turn the coupling on the worm shaft clockwise until the slider is in the cassette down position.)
   Note:
   Before shifting, unlock the slider.
2. Slightly widen the cassette housing frames (R) and (L) to unhook the slider holders (R) and (L) of the slider assembly off the grooves of the cassette housing frames.


Coupling
Worm shaft
Pulley
Cassette housing frame (R)
To be widened.
Cassette housing frame (L)
Slider holder (R)
To be widened.
Slider holder (L)
Slider

(a)

(b)

Figure 1-17.

3. Lift the slider holder (R) upward about 2mm off the slider by pressing two catches with a thin tip screw driver. Take care not to damage the catches.

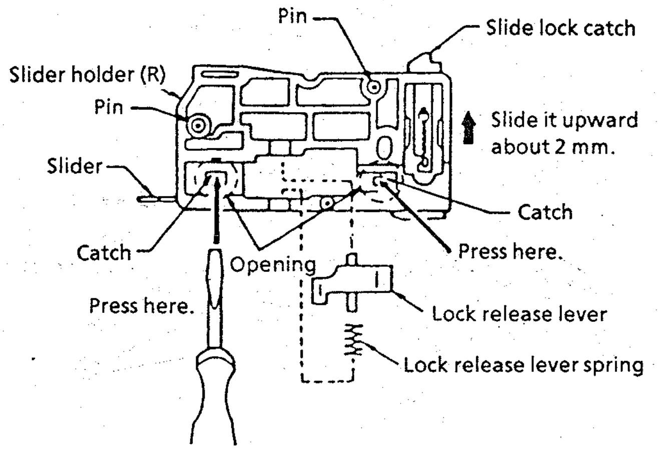

Pin
Slide lock catch
Slider holder (R)
Pin
Slide it upward about 2 mm.
Slider
Catch
Catch
Press here.
Opening
Press here.
Lock release lever
Lock release lever spring

Figure 1-18.

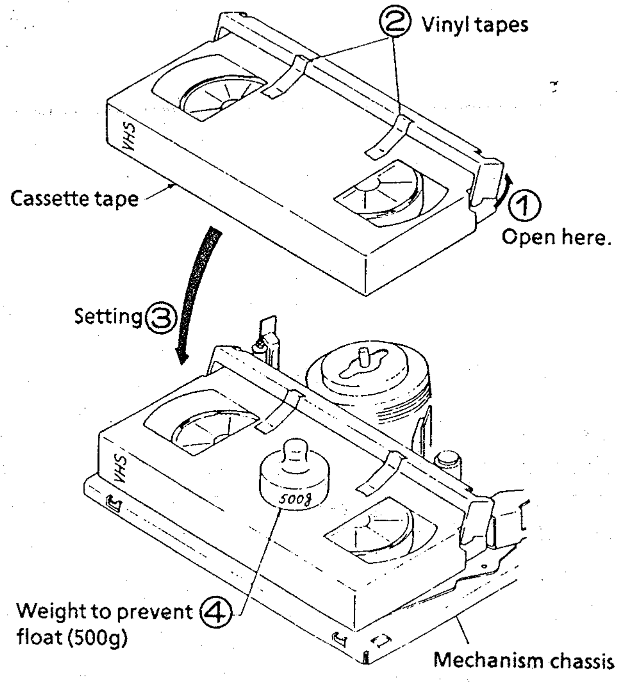
4. Remove the lock release lever from the slider holder (R).

- **Reassembly**

1. Follow the steps for removal in the reverse order. (See Figures 1-17 and 1-18.)
2. Attach the lock release lever to the slider holder (R).
3. Slide the slider holder (R) downward so that the two catches of the slider holder (R) fit the opening of the slider.
4. Slightly widen the cassette housing frames, and set the pins of slider holders (R) and (L) into the grooves of the cassette housing frames.
   Note:
   Check if the pins of the slider holders (R) and (L) fit the grooves of the cassette housing frames, and if the drive gear arm is sufficiently engaged with the slider holders.
5. Turn the coupling counterclockwise until the slider is at the cassette insertion opening.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Plug in the power cord.
2. Turn on the power switch.
3. Open the lid ① of a cassette tape by hand.
4. Hold the lid with two pieces of vinyl tape ②.
5. Set the cassette tape in the mechanism chassis.
6. Weight the cassette tape with a weight ④ to prevent floating.
7. Perform running test.


② Vinyl tapes
VHS
Cassette tape
① Open here.
Setting③
VHS
500g
Weight to prevent ④ float (500g)
Mechanism chassis

Note:
The weight should not be more than 500 g.

Figure 1-19.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

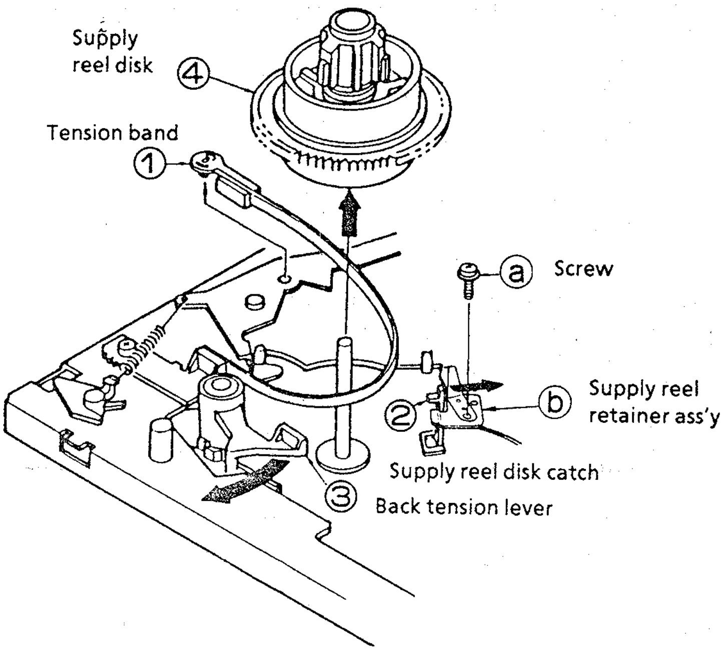
1. Remove the cassette housing control assembly.
2. Set the mechanism in the playback mode with no cassette tape in place. Unplug the power cord.
3. Set the idler gear in the center (neutral).

- **Removal (Supply reel disk)**

1. Remove the tension band ①. (Take care not to deform it.)
2. Unscrew the screw ⓐ and remove the supply reel retainer assembly ⓑ.
3. Release the supply reel disk catch ② and back tension lever ③.
4. Pull the supply reel disk upward.

Notes:

1. Take care not to deform the tension band.
2. Check and adjust the tension pole position. (See page 19.)
3. Be careful not to damage the gear and the idler gear on the supply reel disk.
4. Press the tension band in the direction of the arrow for removal (See Figure 1-20(b)).


Supply reel disk ④
Tension band ①
ⓐ Screw
ⓑ Supply reel retainer ass'y
② Supply reel disk catch
③ Back tension lever

(a)

Note:
When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

(b)

Figure 1-20.

- **Removal (Take-up reel disk)**

1. Unscrew the screw ⓒ and remove the take-up reel retainer.
2. Release the take-up reel disk catch ①.
3. Pull the take-up reel disk ② upward.

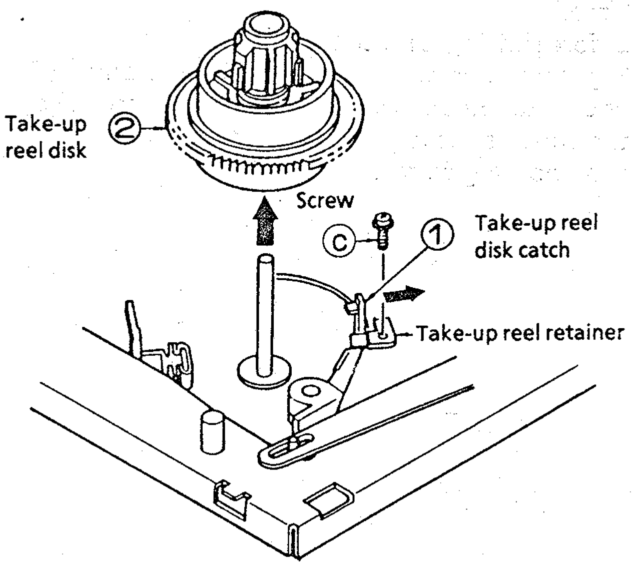

Take-up reel disk ②
Screw ⓒ
① Take-up reel disk catch
Take-up reel retainer

Figure 1-21.

- **Reassembly (Supply reel disk)**

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the supply reel disk catch ② and back tension lever ③.
3. Install a new supply reel disk ④ onto the shaft.
4. Replace the tension band ⑤ around the supply reel disk, and insert it to the hole of the tension arm.
5. Replace the supply reel retainer assembly ⓑ in place, and tighten up the screw ⓐ.

Notes:

1. Take enough care not to deform the tension band during installation of the supply reel disk.
2. Be careful not to damage the supply reel disk gear, back tension lever, supply reel disk catch, or the like with tools.

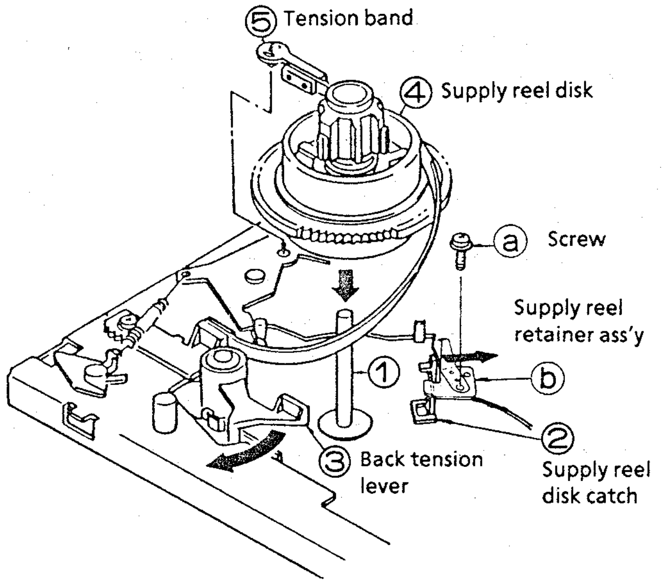

⑤ Tension band
④ Supply reel disk
ⓐ Screw
Supply reel retainer ass'y
①
ⓑ
②
③ Back tension lever
Supply reel disk catch

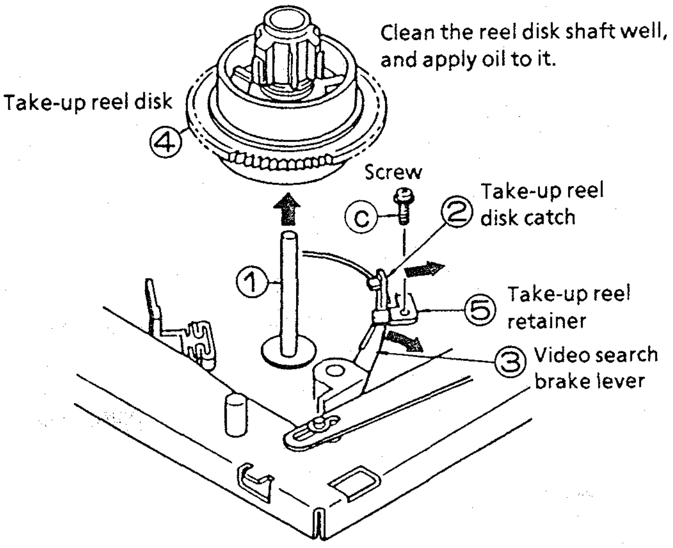
Figure 1-22.

- **Reassembly (Take-up reel disk)**

1. Clean the reel disk shaft ① and apply oil to it.
2. Release the take-up reel catch ② and video search brake lever ③.
3. Install a new take-up reel disk ④ onto the shaft.
4. Replace the take-up reel retainer ⑤ in position and tighten up the screw ⓒ.

Note:

Take care not to damage the video search brake lever.


Clean the reel disk shaft well, and apply oil to it.
Take-up reel disk
④
Screw
ⓒ
②
Take-up reel disk catch
①
⑤
Take-up reel retainer
③
Video search brake lever

Apply a thin tip driver to the arrow position in releasing for easier setting of the take-up reel disk.

Figure 1-23.

* After reassembly, check the video search rewind back tension (see page 18), and check the brake torque (see page 20).

- **Height checking and adjustment**

Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 1-24).

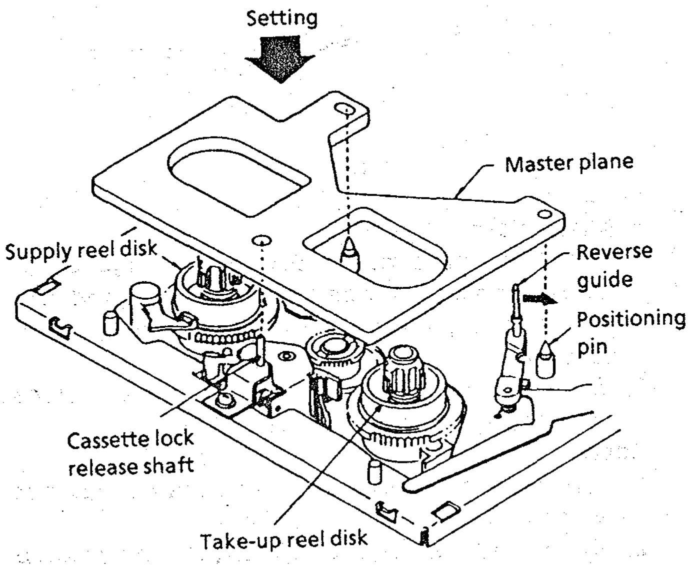

Setting
Master plane
Supply reel disk
Reverse guide
Positioning pin
Cassette lock release shaft
Take-up reel disk

Figure 1-24.

1. For height adjustment, press the reel disk with a finger, and turn it right and left with a screwdriver (see Figure 1-26 (a)).

Set the master plane releasing the reverse guide by a finger.

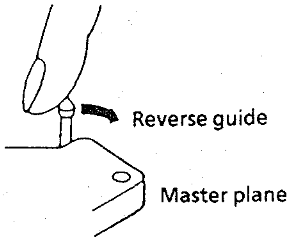
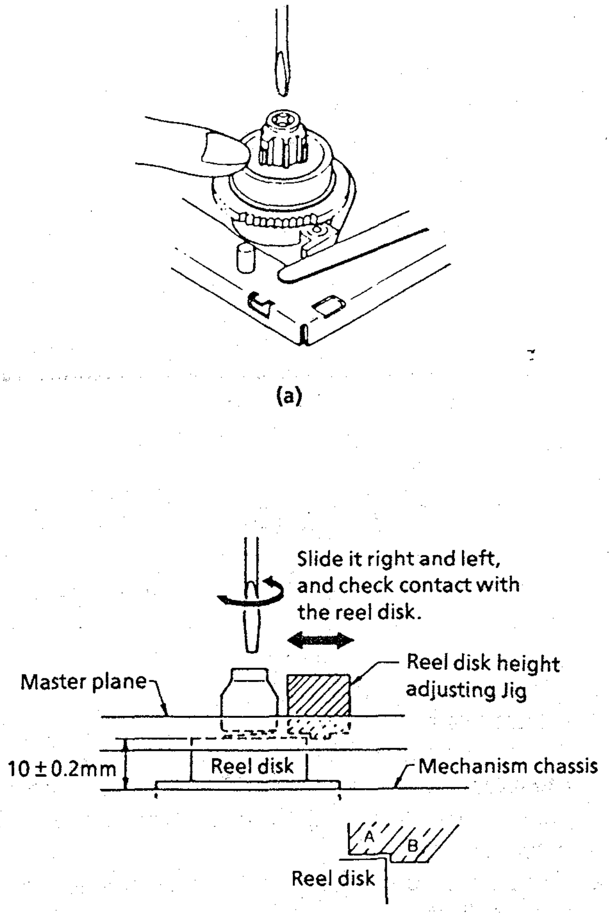

Reverse guide
Master plane

Figure 1-25.

2. Check that the reel disk is lower than part A but higher than part B. If the height is not correct, adjust the height adjusting screw (see Figure 1-26 (b)).

Note:

Whenever replacing the reel disk, perform the height checking and adjustment.


Master plane
Reel disk height adjusting Jig
10±0.2mm
Reel disk
Mechanism chassis
A
B
Reel disk

(a)

Slide it right and left, and check contact with the reel disk.

(b)

Figure 1-26.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- **Remove the cassette housing control assembly.**

- **Setting**

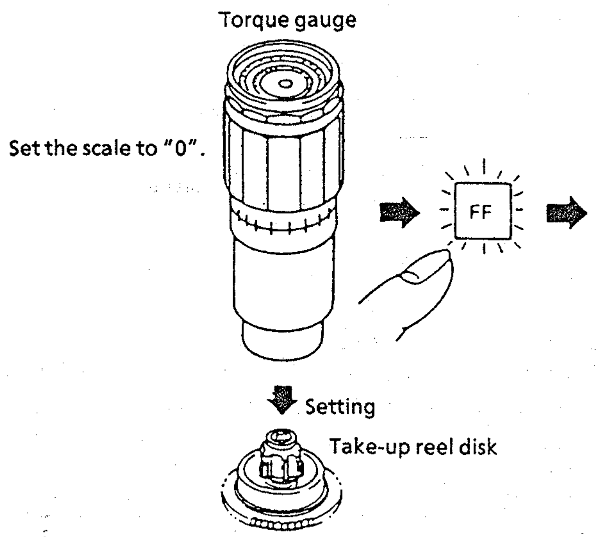

Torque gauge
Set the scale to "0".
FF
Setting
Take-up reel disk

Figure 1-27.

- **Checking**

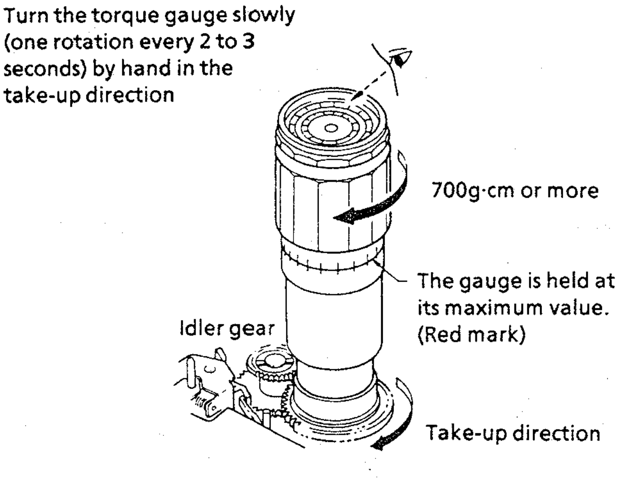

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction
700g·cm or more
The gauge is held at its maximum value. (Red mark)
Idler gear
Take-up direction

Figure 1-28.

- **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**

- **Setting**

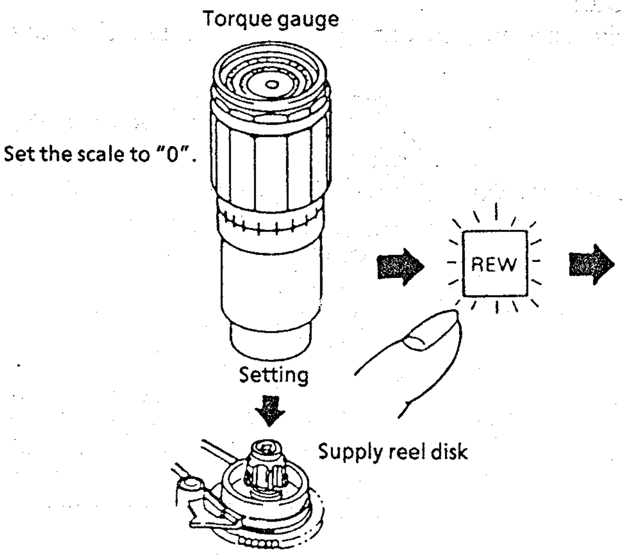

Torque gauge
Set the scale to "0".
REW
Setting
Supply reel disk

Figure 1-29.

- **Checking**

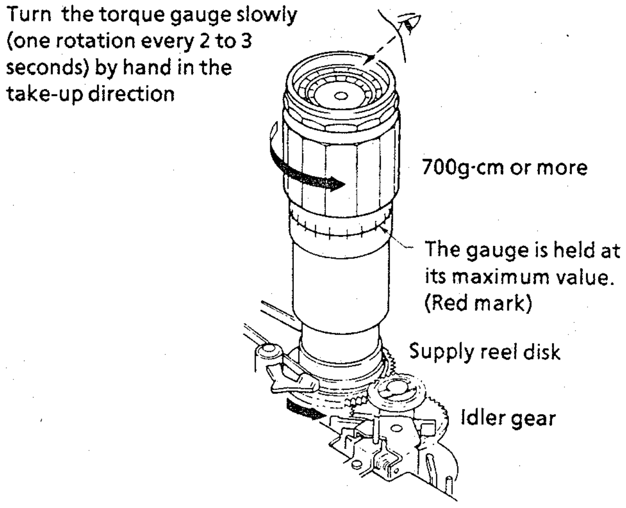

Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction
700g·cm or more
The gauge is held at its maximum value. (Red mark)
Supply reel disk
Idler gear

Figure 1-30.

- **Adjustment**

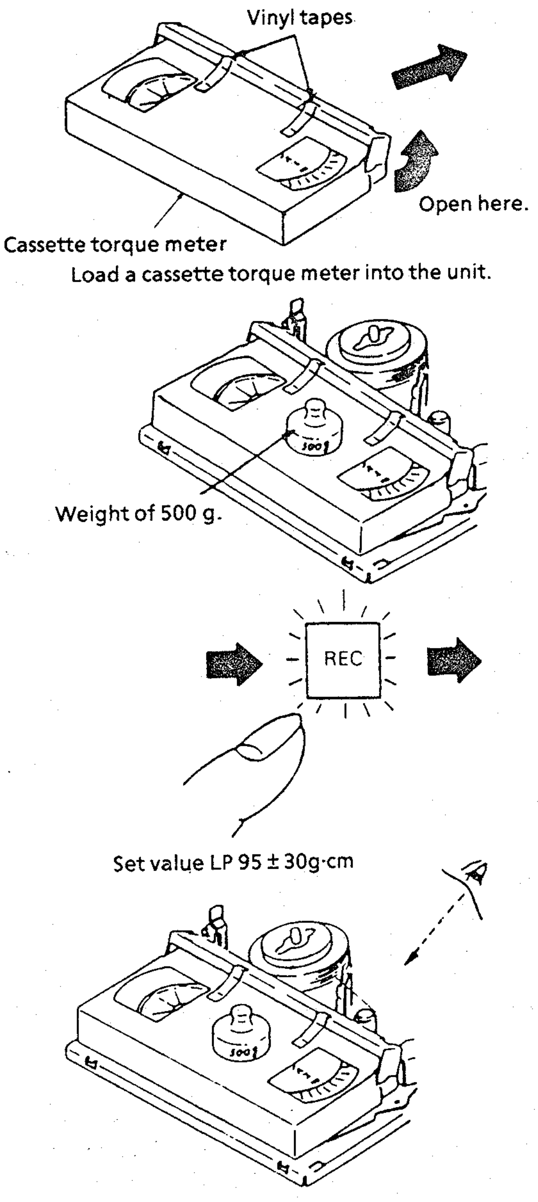
1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

e the cassette housing control assembly.
2. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tape.



Load a cassette torque meter into the unit.

Set value LP 95 ± 30g·cm

Figure 1-31.

- **Checking**

1. Check that the torque is in the range of 95 ± 30 g·cm.
2. The torque fluctuates due to the rotational deviation of the reel drive unit. Use the center of the fluctuation as the value.
3. Place the unit in the LP record mode, and check that the take-up torque is within the range.

- **Adjustment**

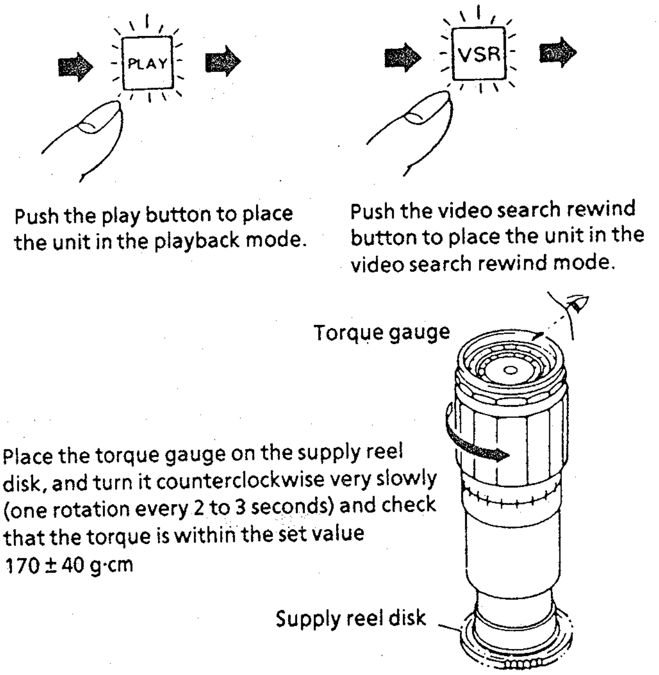
If the take-up torque in the playback mode is outside the range, replace the take-up reel disk.

Note:
Weight the cassette torque meter to prevent floating.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**

- **Checking**



Push the play button to place the unit in the playback mode.

Push the video search rewind button to place the unit in the video search rewind mode.

Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 170 ± 40 g·cm

Figure 1-32.

Note:
Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

- **Adjustment**

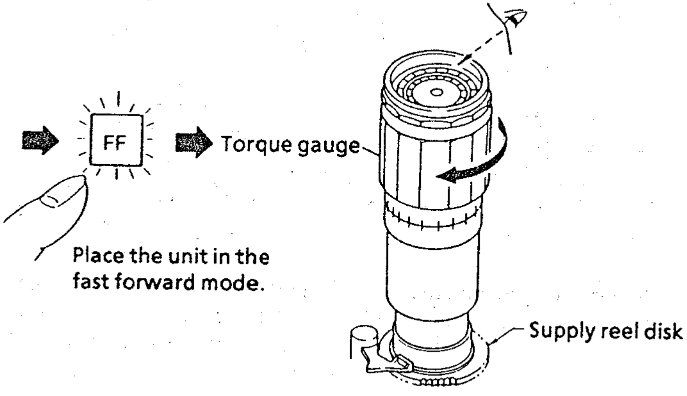
If the take-up torque in video search rewind mode is outside the range, replace the supply reel disk.

Note:
The torque fluctuates due to the rotational deviation of the supply reel disk. Use the center of the fluctuation at the value.

CHECKING THE FAST FORWARD BACK TENSION

- **Remove the cassette housing control assembly.**

- **Checking**


FF
Torque gauge
Supply reel disk

Place the unit in the fast forward mode.

Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g·cm

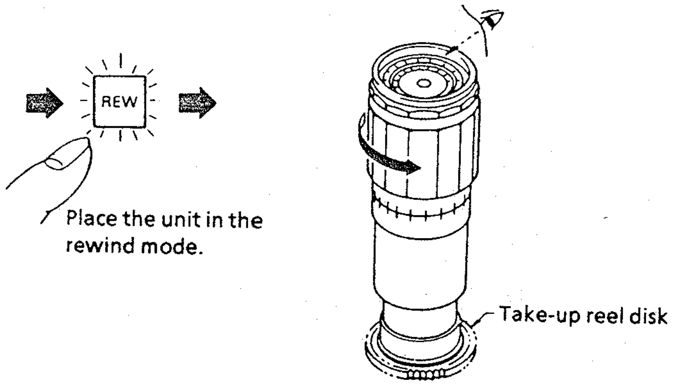
Figure 1-33.

Note:
Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.

CHECKING THE REWIND BACK TENSION

- **Remove the cassette housing control assembly.**

- **Checking**


REW
Take-up reel disk

Place the unit in the rewind mode.

Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within 15 ± 5 g·cm.

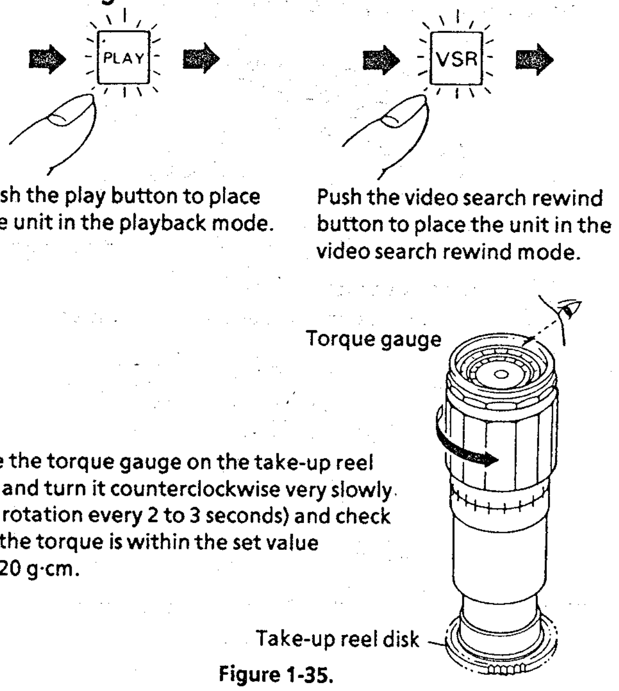
Figure 1-34.

Note:
Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- **Remove the cassette housing control assembly.**

- **Checking**


PLAY
VSR
Torque gauge
Take-up reel disk

Push the play button to place the unit in the playback mode.

Push the video search rewind button to place the unit in the video search rewind mode.

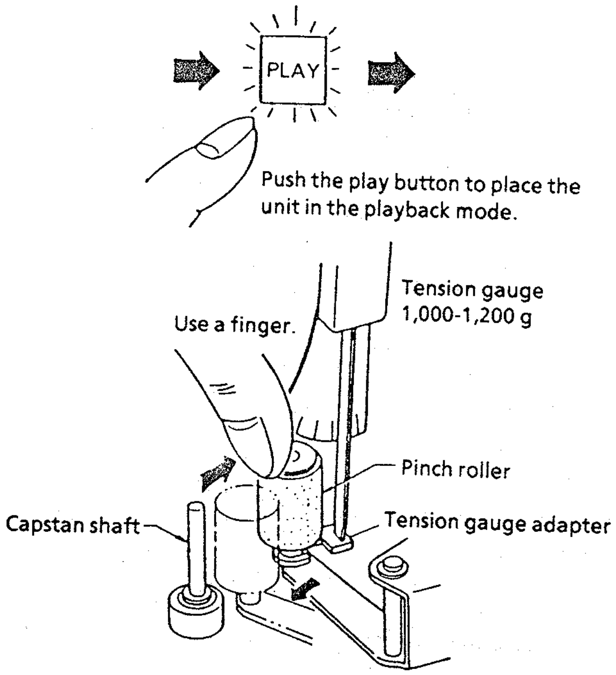
Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 45 ± 20 g·cm.

Figure 1-35.

Note:
Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

CHECKING THE PINCH ROLLER PRESSURE

- **Remove the cassette housing control assembly.**


PLAY
Use a finger.
Tension gauge
1,000-1,200 g
Pinch roller
Capstan shaft
Tension gauge adapter

Push the play button to place the unit in the playback mode.

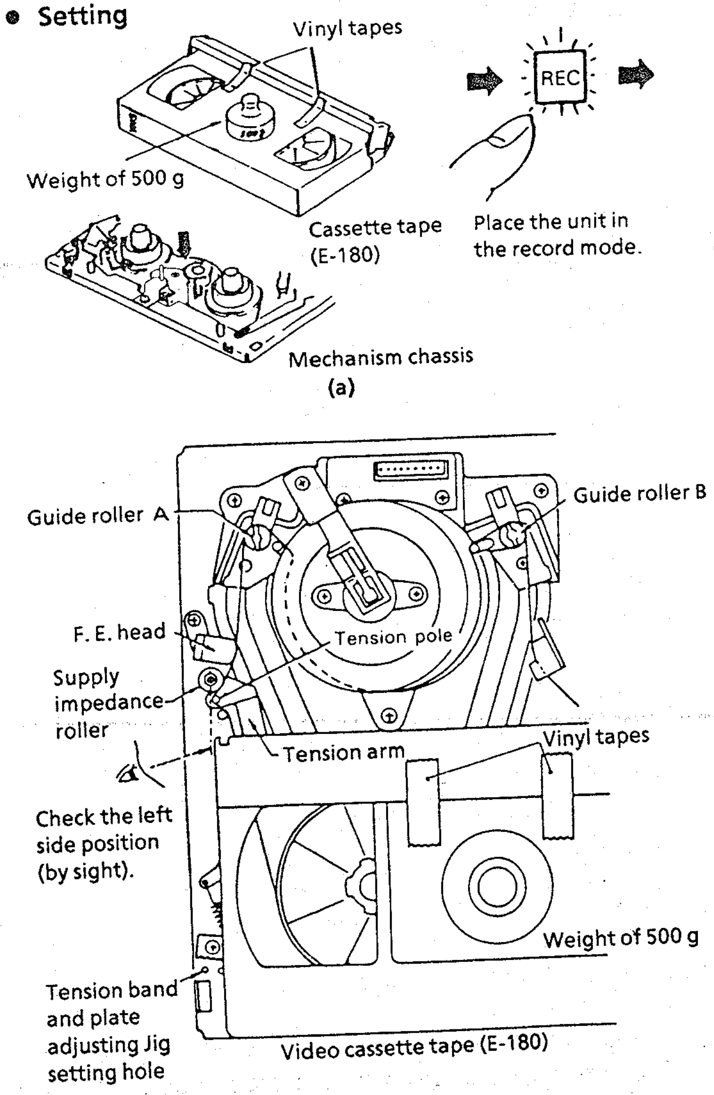
Figure 1-36.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 1000 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- **Remove the cassette housing control assembly.**

- **Setting**


Vinyl tapes
REC
Weight of 500 g
Cassette tape (E-180)
Place the unit in the record mode.
Mechanism chassis
Guide roller A
Guide roller B
F. E. head
Tension pole
Supply impedance roller
Tension arm
Vinyl tapes
Check the left side position (by sight).
Weight of 500 g
Tension band and plate adjusting Jig setting hole
Video cassette tape (E-180)

(a)

(b)

Figure 1-37.

- **Checking**

1. The guide rollers (A, B) operate to bring the tape outside the cassette tape and simultaneously the tension pole moves to the left, loading the tape. At that time (loading completed), check the position of the tension pole.
2. At the beginning of the tape (E-180), check that the tension pole's left side is aligned with the supply impedance roller's center by sight.
3. Check that the end of the tape is neither curled against the flange of the supply impedance roller nor over it.
4. During the video search rewind mode with no cassette tape in place, check that the supply reel disk is free from the tension band.

- **Position adjustment (record mode)**

When the tension pole is at the right of the supply impedance roller's center:
Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting Jig until it is in the set value range (center). Then secure it with the tightening screw.

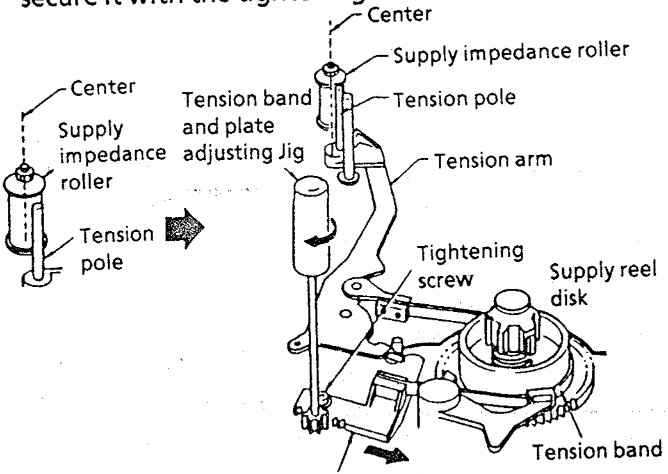

Center
Supply impedance roller
Center
Supply impedance roller
Tension pole
Tension band and plate adjusting Jig
Tension pole
Tension arm
Tightening screw
Supply reel disk
Tension band
Tension band adjustment bracket

Figure 1-38.

- **Position adjustment (record mode)**

When the tension pole is at the left of the supply impedance roller's center:
Untighten the tightening screw, and shift the tension band adjustment bracket in the direction of the arrow using a tension band and plate adjusting Jig until it is in the set value range (center). Then secure it with the tightening screw.

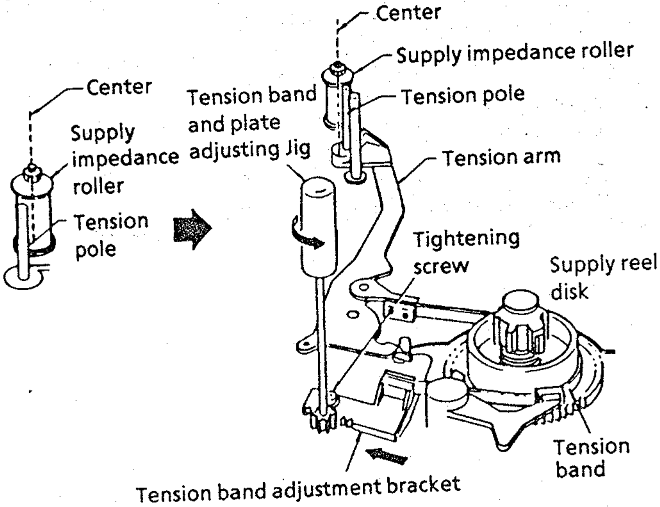

Center
Supply impedance roller
Center
Supply impedance roller
Tension pole
Tension band and plate adjusting Jig
Tension pole
Tension arm
Tightening screw
Supply reel disk
Tension band
Tension band adjustment bracket

Figure 1-39.

CHECKING AND ADJUSTMENT OF RECORD / PLAYBACK BACK TENSION

- **Remove the cassette housing control assembly.**

- **Checking**

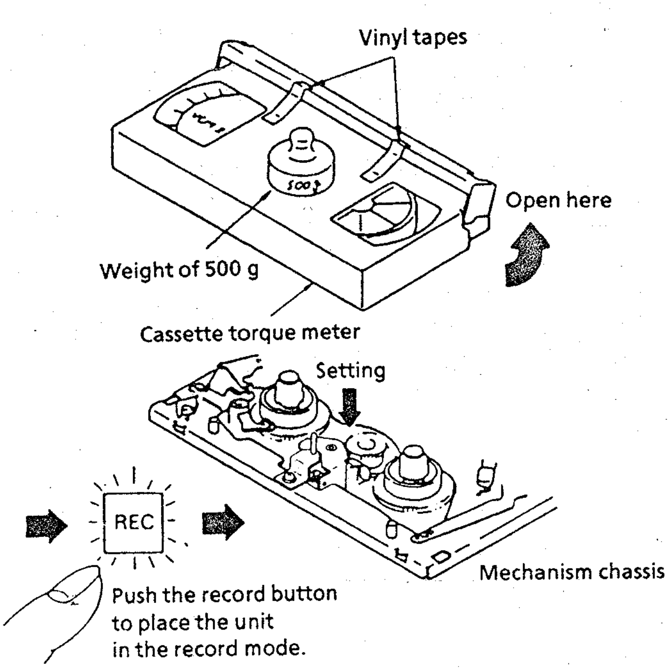

Vinyl tapes
500
Open here
Weight of 500 g
Cassette torque meter
Setting
REC
Mechanism chassis
Push the record button to place the unit in the record mode.

Figure 1-40.

1. Put a cassette torque meter into the unit.
2. Push the record button to place the unit in the record mode.
3. Check that the back tension indicated by the gauge is within the set range 31 to 36 g·cm.

Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

- Adjustment

1. If the reading of the cassette torque meter is less than specified, move the tip of the tension spring hook plate toward the hole A.
2. If the reading of the cassette torque meter is more than specified, move the tip of the tension spring hook plate toward the hole B.

   Note:

   Put a thin screw driver (–) in the shaft hole, lean it toward you, and turn it for easier shift of the tension spring hook plate in the direction of A or B.

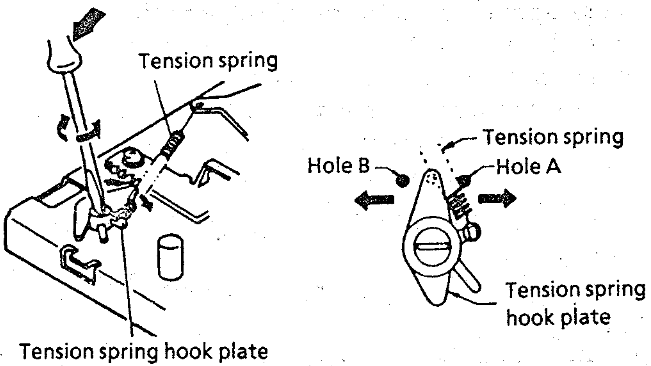

Tension spring
Tension spring
Hole B
Hole A
Tension spring hook plate
Tension spring hook plate

Figure 1-41.

CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**

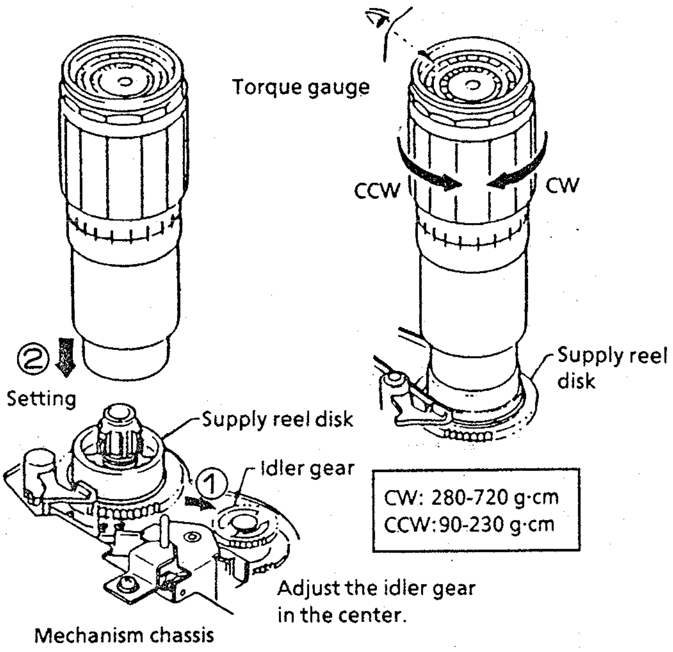
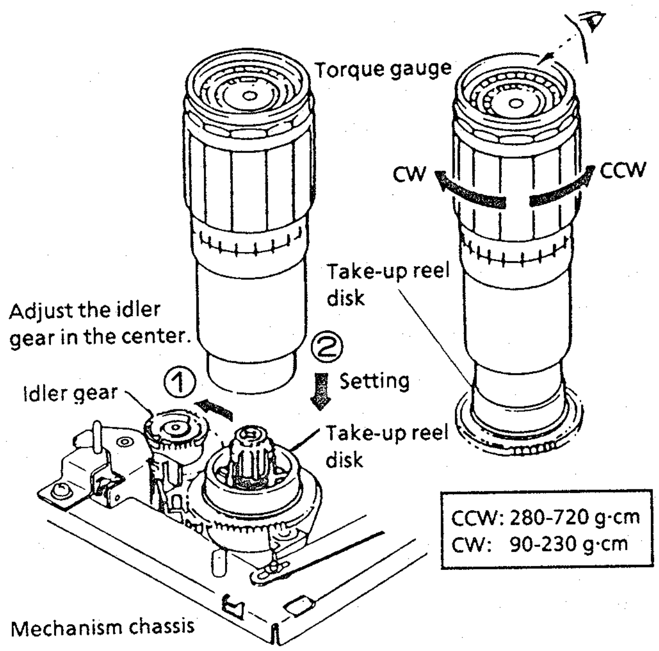

Torque gauge
CCW
CW
②
Setting
Supply reel disk
Supply reel disk
①
Idler gear
CW: 280-720 g·cm
CCW: 90-230 g·cm
Adjust the idler gear in the center.
Mechanism chassis

Figure 1-42.

1. Remove the cassette housing control assembly.
2. Place the mechanism in the stop mode by unplugging the power cord in the fast forward or rewind mode.
3. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 280 to 720 g·cm, CCW direction = 90 to 230 g·cm, and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

- **Checking the brake torque at the take-up side**


Torque gauge
CW
CCW
Take-up reel disk
Adjust the idler gear in the center.
②
Idler gear
①
Setting
Take-up reel disk
Mechanism chassis

CCW: 280-720 g·cm
CW: 90-230 g·cm

Figure 1-43.

1. Remove the cassette housing control assembly.
2. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction= 280 to 720 g· cm, CW direction =90 to 230 g·cm, and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

- **Adjustment of the brake torque at the supply side and the take-up side**

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever felt, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake or the main brake spring.

REPLACEMENT OF MAIN BRAKE

1. Remove the reel belt and the reel block FFC (Full Flat Cable).
2. Remove the cut washer ① off the brake shifter.
3. Unscrew the four screws ② and then the take-up reel retainer.
4. Remove the reel block assembly Ⓐ downward.
5. Remove the cut washer ③ first and then the reel pulley.
6. Unscrew the two screws ④ and detach the idler assembly.
7. Unhook the back tension lever spring ⑤ and remove the back tension lever ⑥. (Undo the hook under the reel chassis.)
8. Open the shifter latch ⑦ and remove the brake shifter assembly ⑧.
9. Release the reel disk catches ⑬and then remove the left and right reel disk assemblies ⑨ and ⑩.
10. Finally remove the main brake levers ⑪and the main brake spring ⑫.

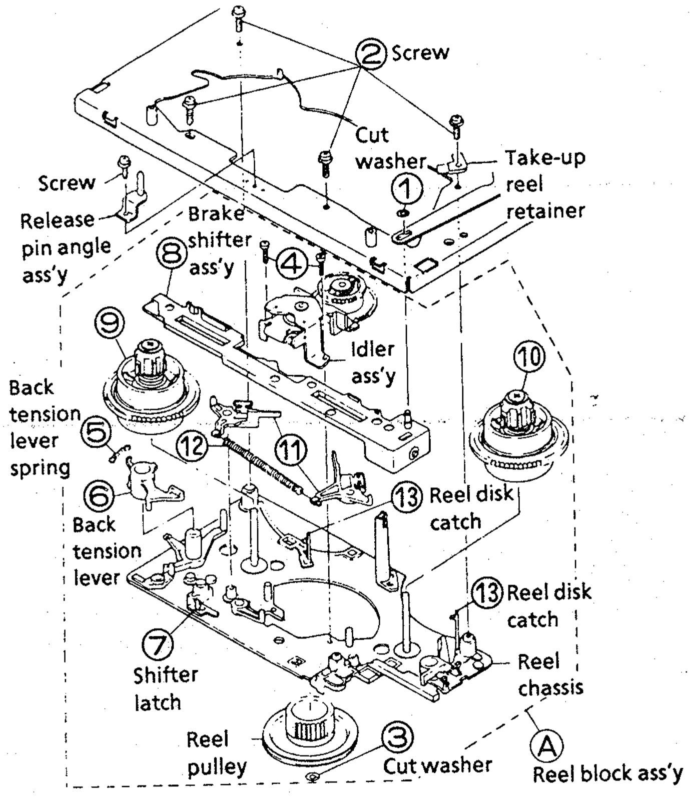

② Screw
Cut washer
①
Take-up reel retainer
Screw
Release pin angle ass'y
Brake shifter ass'y
⑧
④
Idler ass'y
⑨
⑩
Back tension lever spring
⑤
⑫
⑪
⑥
Back tension lever
⑬ Reel disk catch
⑬ Reel disk catch
⑦
Shifter latch
Reel chassis
Reel pulley
③
Cut washer
Ⓐ
Reel block ass'y

Figure 1-44.

Note:
When the main brake is replaced, perform the height checking and adjustment (see page 15), and the brake torque checking (see page 20).

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

● Removal

1. Loosen the tilt adjusting screw ①.
2. Remove the azimuth adjusting screw ②.
3. Remove the A/C head screw ③.
4. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 24). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

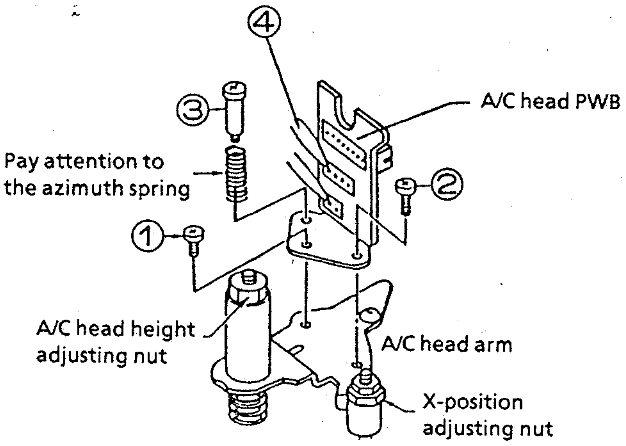

④
③
A/C head PWB
Pay attention to the azimuth spring
②
①
A/C head height adjusting nut
A/C head arm
X-position adjusting nut

Figure 1-45.

● Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

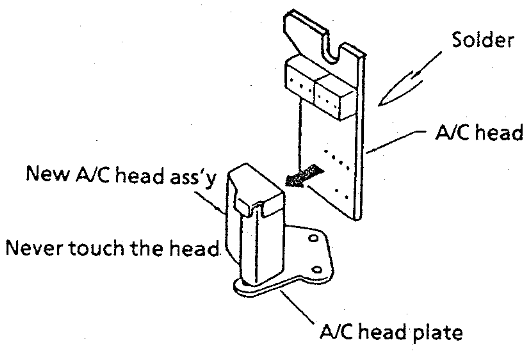

Solder
A/C head PWB
New A/C head ass'y
Never touch the head
A/C head plate

Figure 1-46.

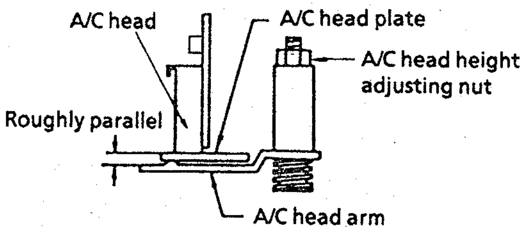
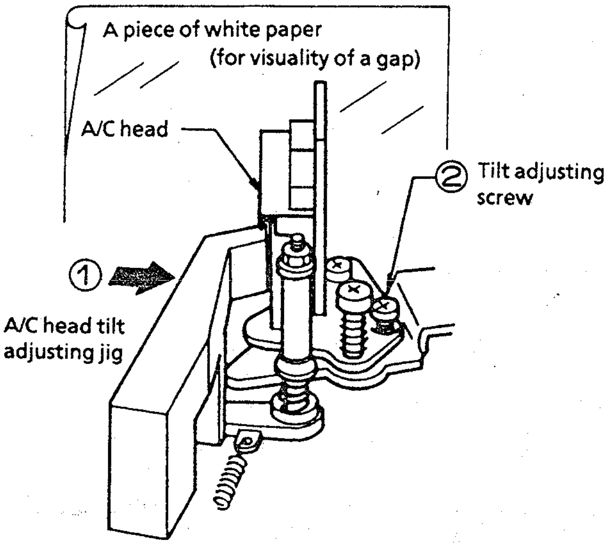

A/C head
A/C head plate
A/C head height adjusting nut
Roughly parallel
A/C head arm

Figure 1-47.

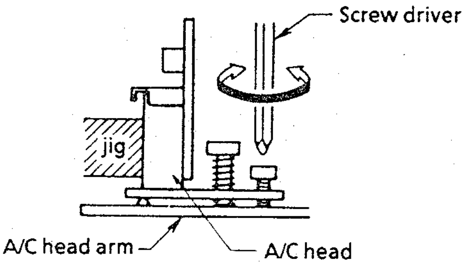
● Adjustment

[A/C head tilt angle]

1. Set the mechanism to the loading mode.
2. Place the A/C head tilt adjusting Jig ①.
3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the Jig and the A/C head.


A piece of white paper (for visuality of a gap)
A/C head
② Tilt adjusting screw
①
A/C head tilt adjusting jig

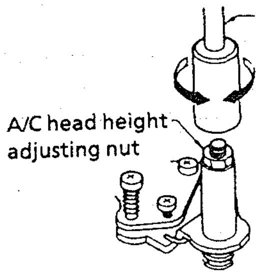
(a)


Screw driver
jig
A/C head arm
A/C head

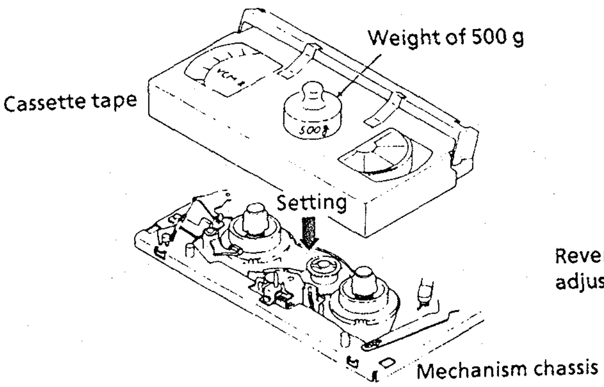
(b)

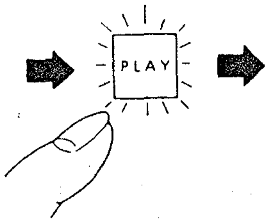
Figure 1-48.

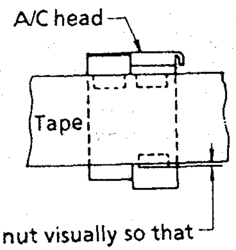
[A/C head height rough adjustment]


Box driver
A/C head height adjusting nut

Roughly adjust the height of the A/C head by turning the A/C head adjusting hexagon nut with the specialized box driver until the tape is in the position shown below.


Weight of 500 g
Cassette tape
500g
Setting
Mechanism chassis

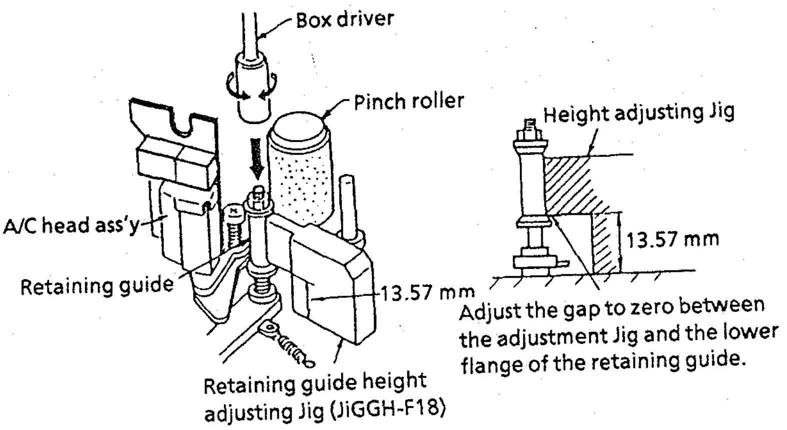



A/C head
Tape

Adjust the nut visually so that the control head is visible 0.3 to 0.5 mm below the bottom of the tape.

Figure 1-49.

[Height adjustment of retaining guide]

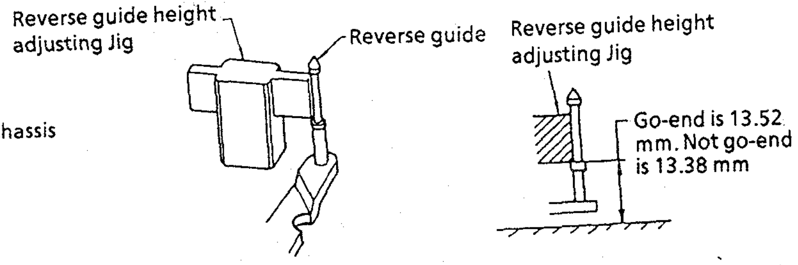

Box driver
Pinch roller
A/C head ass'y
Retaining guide
13.57 mm
Retaining guide height adjusting Jig (JiGGH-F18)
Height adjusting Jig
13.57 mm

Adjust the gap to zero between the adjustment Jig and the lower flange of the retaining guide.

(a) (b)

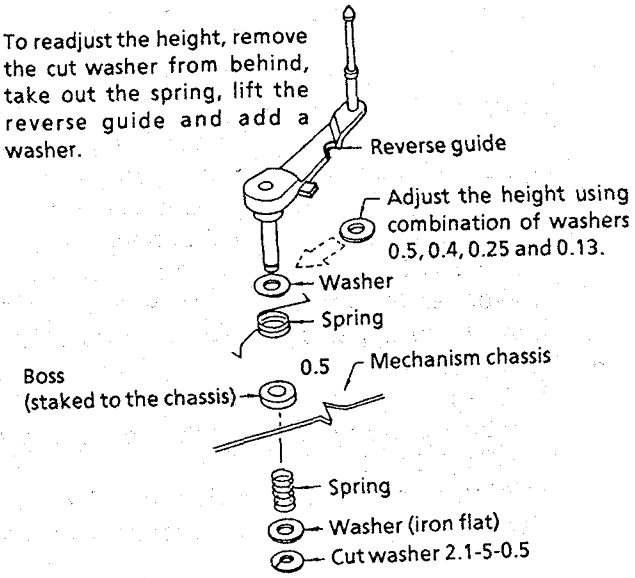
Figure 1-50.

[Height adjustment of reverse guide]


Reverse guide height adjusting Jig
Reverse guide
Reverse guide height adjusting Jig
Go-end is 13.52 mm. Not go-end is 13.38 mm

(a) (b)

To readjust the height, remove the cut washer from behind, take out the spring, lift the reverse guide and add a washer.


Reverse guide
Adjust the height using combination of washers 0.5, 0.4, 0.25 and 0.13.
Washer
Spring
0.5
Mechanism chassis
Boss (staked to the chassis)
Spring
Washer (iron flat)
Cut washer 2.1-5-0.5

(c)

Figure 1-51.

HEIGHT ADJUSTMENT OF RETAINING GUIDE AND REVERSE GUIDE

Note:

Before the rough adjustment of the tape drive train, check that the retaining guide height is within the value in Figure 1-50 by using the special Jigs.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Check and adjust the position of the tension pole. (See page 19.)
3. Check and adjust the video search rewind back tension. (See page 18.)
4. Set the tilt angle of the A/C head. (See page 22.)
5. Rough adjustment of tape drive train.
   a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP2201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
   b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 1-52.)
   c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode.
   (Place a 500 g. weight on the cassette tape to prevent floating of the cassette tape.)

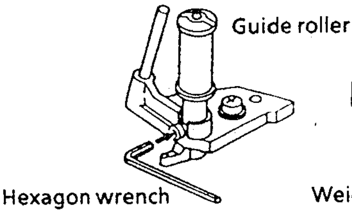


Figure 1-52.

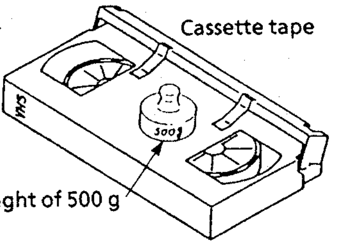
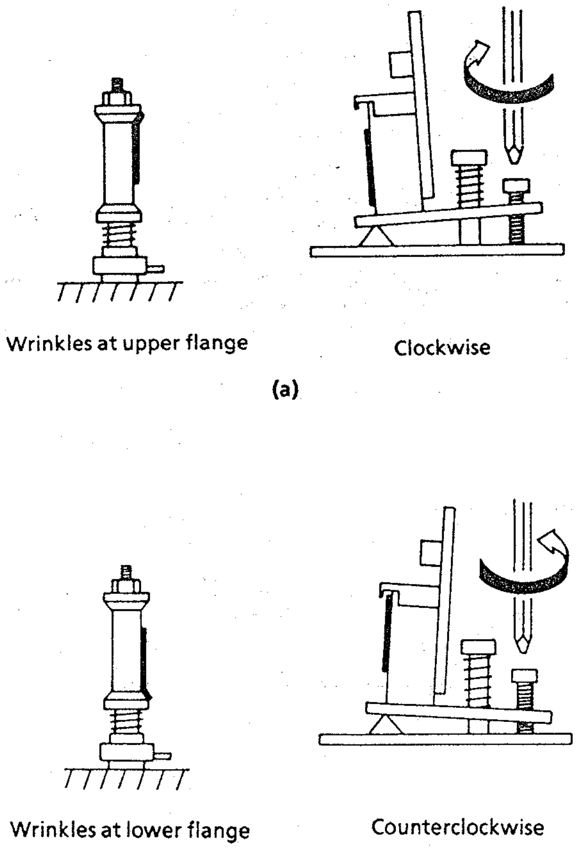


Figure 1-53.

   d) Change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (–) tracking button, and check a flat response is obtained on the waveform.
   e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
   f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
      1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Fig. 1-54 (a).
      2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Fig. 1-54 (b).



(b)

Figure 1-54.

Notes:

1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelop becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

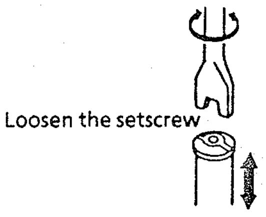


Figure 1-55.

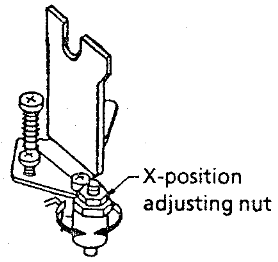


Figure 1-56.

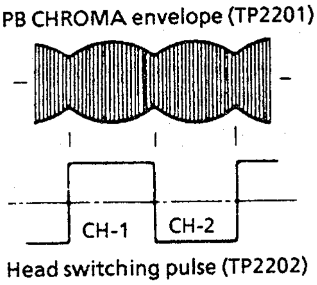


Figure 1-57.

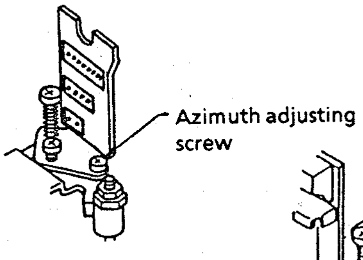


Figure 1-58.

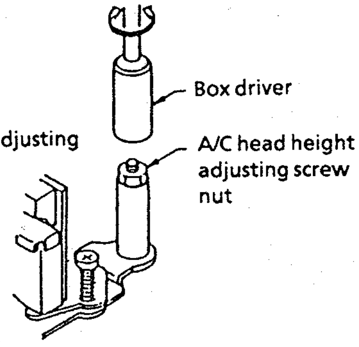


Figure 1-59.

6. Adjustment of A/C head height and azimuth
   a) Connect an oscilloscope to the audio output terminal.
   b) Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 1-58.)
   c) Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
   d) Perform the adjustment in b) again.
   e) After this adjustment, apply glyptal to the screws and nuts to fix them.

7. Adjustment of tape drive train and X-Position.
   a) Connect the oscilloscope to the test points (TP2201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
   b) Play back the tape drive train alignment tape.
   c) Push the (+) or (–) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelop waveform that is as flat as possible.
   d) If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 1-60.
   e) Adjust for maximum flatness of the envelope as the step 5, e) in page 24.

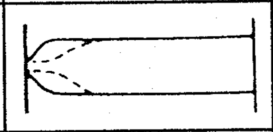
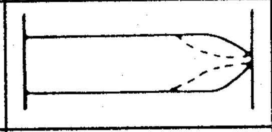
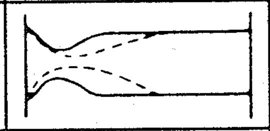
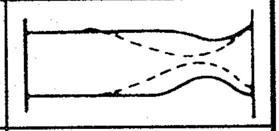
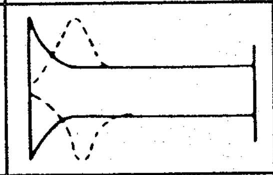
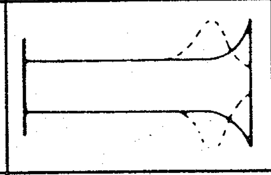
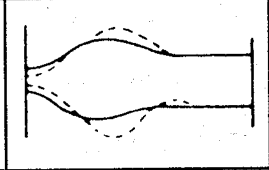
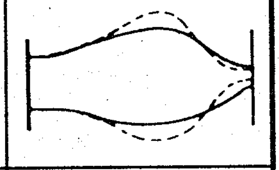
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 1-60.

f) Push the (+) or (–) tracking button to check that a flat response is obtained on the envelope waveform.
g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.

8. Adjustment of A/C head X-position.
   a) Push the (+) and (–) tracking buttons at the same time to the preset mode.
   b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
   c) Adjust the playback switching point.
   d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

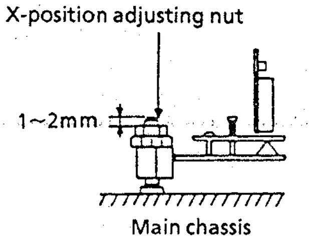

X-position adjusting nut
1~2mm
Main chassis

Figure 1-61.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- **Remove the cassette housing control assembly.**

- **Removal (Follow the order of indicated numbers.)**

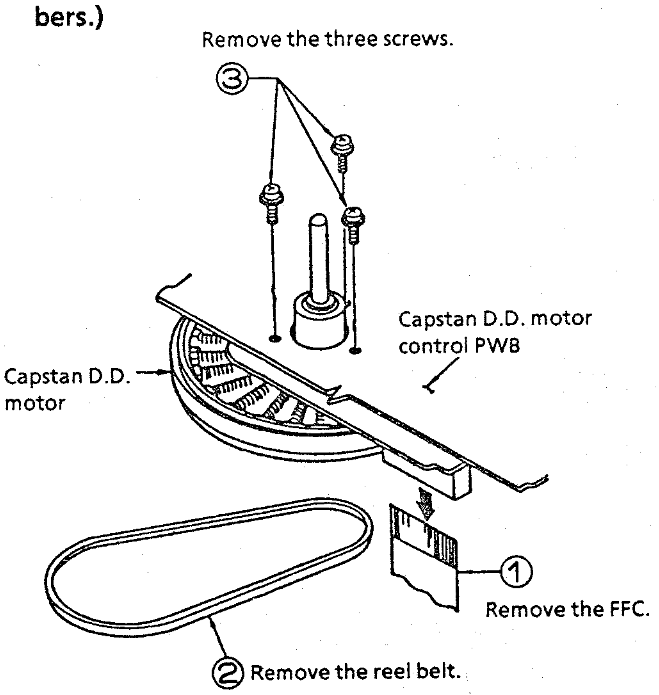

Remove the three screws.
③
Capstan D.D. motor control PWB
Capstan D.D. motor
①
Remove the FFC.
② Remove the reel belt.

Figure 1-62.

- **Reassembly**

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Insert the FFC into the capstan D.D. motor control PWB.
3. Attach the reel belt.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check and adjust the servo circuit.

REMOVAL AND REASSEMBLY OF THE LOADING GEAR BLOCK

1. Remove the cassette housing control assembly.
2. Remove the reel belt.
3. Remove the reel block.

- **Removal**

Notes:

1. Use care not to deform the parts hooked to the take-up loading gear and supply loading gear as shown in Figure 1-63.

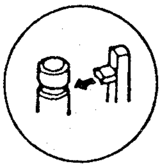


Figure 1-63.

2. In removing the loading gear, secure the guide roller with a rubber band or the like beforehand for easier reassembly.

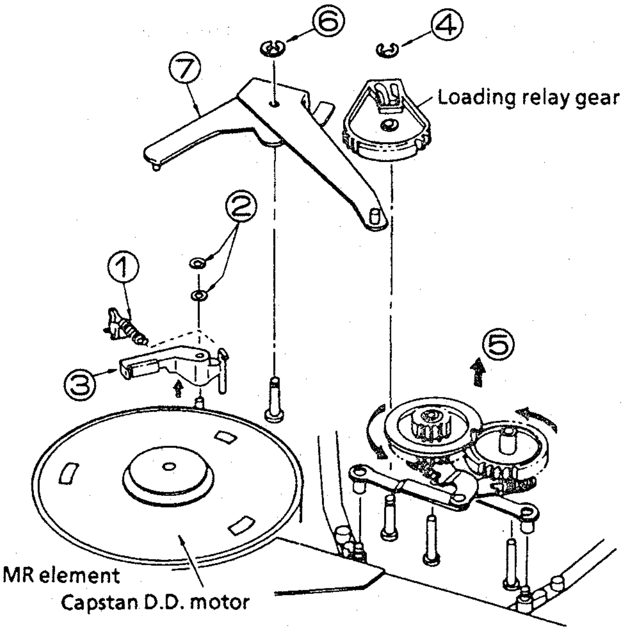

⑥
④
⑦
Loading relay gear
②
①
③
⑤
MR element
Capstan D.D. motor

Figure 1-64.

1. Remove the slow brake spring ①.
2. Remove the washers ②.
3. Remove the slow brake lever ③.
4. Remove the E ring ④.
5. Rotate the take-up loading gear, take-up loading arm assembly, supply loading gear and supply loading arm assembly slightly in the loading direction, and take them ⑤ all out.
6. Remove the E ring ⑥.
7. Remove the relay gear drive lever ⑦.

- **Reassembly**
  Reverse the procedure. Be sure to match the tally marks on the gears.

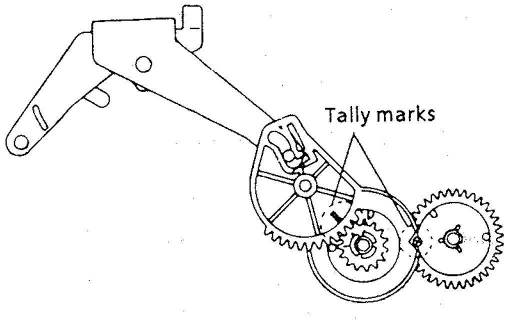


Figure 1-65.

Notes:

1. When reassembling, apply specified grease to the following points; all the gear teeth, all the gear shafts and the cam groove of loading relay gear.
2. Be careful not to deform the supply/take-up loading arms.
3. Be careful to keep clean the slow brake lever felt.
4. Be also careful to keep the outer surface of the capstan D.D. motor free from dust and dirt. (If stained, the MR (Magnet Resistor) element might be damaged.)
5. Take care not to deform the anti-fall hooks of the slow brake lever and supply/ take-up loading gears more than required.

REMOVAL AND REASSEMBLY OF LOADING BLOCK

- **Removal**

1. Remove the leads ①.
2. Remove the cassette loading belt ②.
3. Unscrew the three screws ③.
4. Pull the loading block upward.

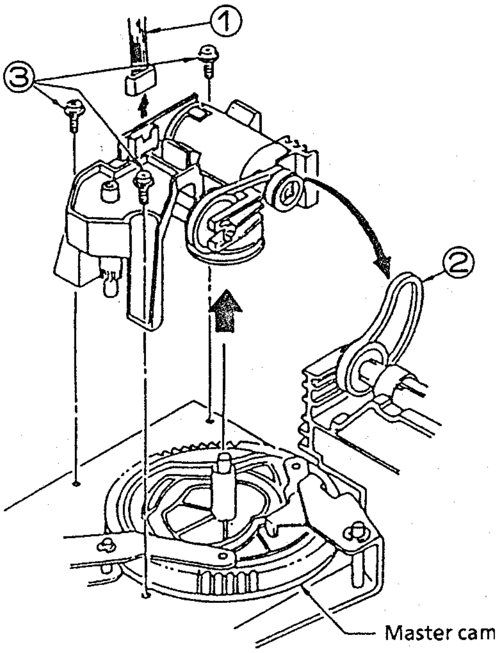


Figure 1-66.

Note:
When using a magnetic screw driver in removal of three screws, do not allow the magnetic driver to hit the A/C head or drums.

- **Reassembly**

1. Turn the master cam all the way counterclockwise.
2. Match the tally mark on the cam switch with the mating mark. Fit the loading block and the master cam with each other. Tighten up the three screws.

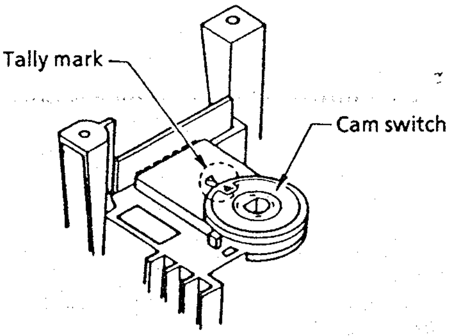


Figure 1-67.

3. Finally connect the leads and apply the cassette loading belt.

Notes:

1. Be careful not to scratch the gear.
2. Be careful not to stain the belt. If dirty, clean it up with the specified cleaning liquid.

REPLACEMENT OF LOADING MOTOR

1. Set the cassette ejected condition by placing the unit in the cassette eject mode.
2. Unplug the power cord.
3. Remove the loading block in accordance with the statements and drawings above.

- **Removal**

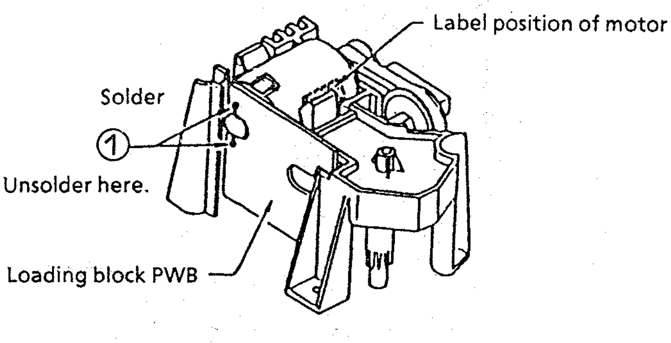
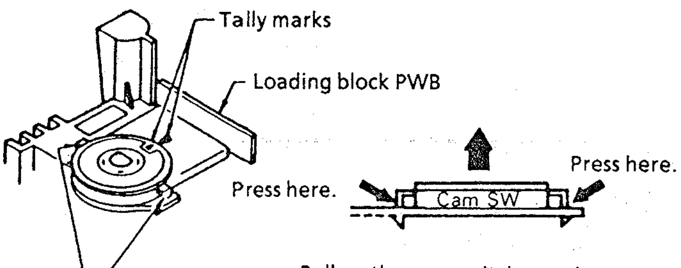

Label position of motor
Solder
①
Unsolder here.
Loading block PWB

Figure 1-68.

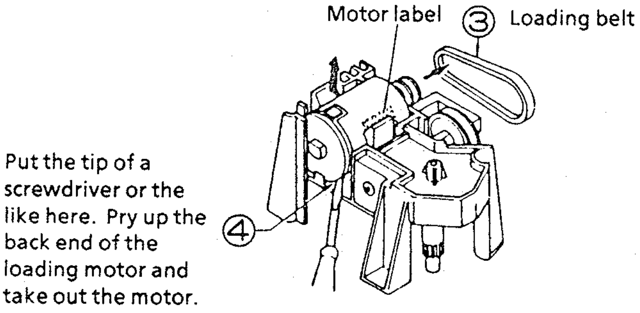
1. Unsolder the leads ① from the loading motor.
2. Unlock the left and right catches ② of the cam switch off the loading block. Take out the cam switch and loading block PWB (See Figure 1-69).


Tally marks
Loading block PWB
Press here.
Press here.
Cam SW
②
Catches of cam switch

Pull up the cam switch pressing the catches. Remove the cam switch together with the loading block PWB.

Figure 1-69.

3. Take out the loading belt ③.
4. Pry up the back end of the loading motor with a screw driver or the like as in Figure 1-70 and take out the motor.


Motor label
③ Loading belt
④

Put the tip of a screwdriver or the like here. Pry up the back end of the loading motor and take out the motor.

Figure 1-70.

- **Reassembly**

1. Remove the loading motor, and mount a new loading motor as in Figure 1-71.
2. Place the loading motor so that its label is visible as shown in Figure 1-71. Make sure that the screw hole at the motor shaft, protuberance on the loading block, and the motor's back end marked with the arrow are mated with each other.

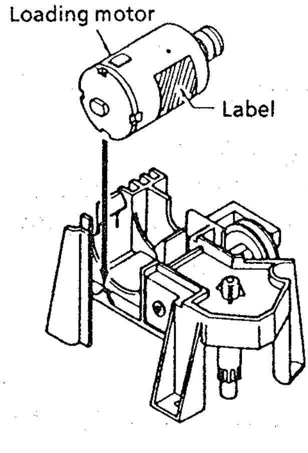
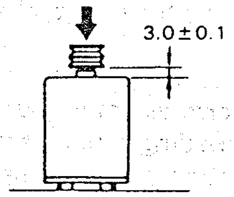

Loading motor
Label

Figure 1-71.



Note:
When press-fitting the loading motor pulley, keep the pressure less than 5 kg, and the gap between the motor and pulley should be 3.0±0.1 mm.

Figure 1-72.

3. Set the loading block PWB and the cam switch in position.
4. Resolder the leads to the loading motor.
5. Finally place the loading block (See page 27).
6. Attach the loading belt.

REPLACEMENT OF MASTER CAM

- **Removal**

1. Remove the E ring ①.
2. Remove the half-loading drive lever ②.
3. Remove the E ring ③.
4. Remove the pinch roller lever ④.
5. Pull out the master cam ⑤ upward.

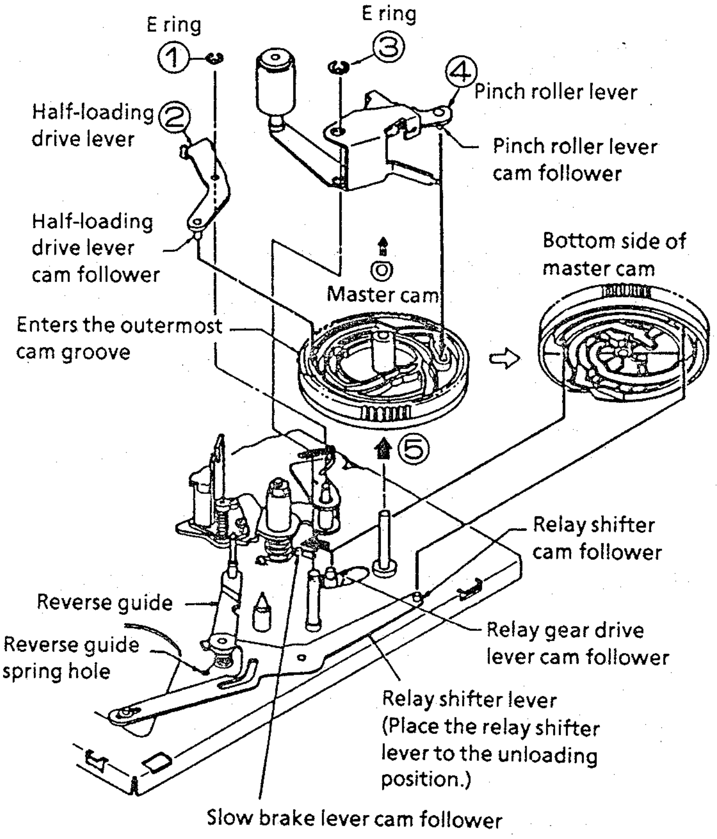

E ring
①
E ring
③
④
Pinch roller lever
Half-loading drive lever ②
Pinch roller lever cam follower
Half-loading drive lever cam follower
Bottom side of master cam
Master cam
Enters the outermost cam groove
⑤
Relay shifter cam follower
Reverse guide
Reverse guide spring hole
Relay gear drive lever cam follower
Relay shifter lever
(Place the relay shifter lever to the unloading position.)
Slow brake lever cam follower

Figure 1-73.

- **Reassembly**

1. Place the relay gear drive lever in the unloading state.
2. Place the relay shifter so that it is in contact with the reverse guide spring hole in the mechanism chassis. Release the slow brake lever with a finger to bring it away from the capstan (in the direction of arrow). Then place the master cam so that the D cut-off part of the master cam faces the direction of arrow.
3. Place the half- loading recipro lever's cam follower so that it fits in the master cam's circumferential cam groove (marked with arrow), attach the E ring, then mount the half-loading recipro lever.
4. Turn the master cam somewhat clockwise until the pinch roller lever's cam follower goes into the master cam's groove (marked with arrow). Mount the pinch roller lever and then attach the E ring.
5. Rotate the master cam by hand to make sure all the four levers (relay gear drive lever, half-loading recipro lever, pinch roller lever, and relay shifter lever) are in the cam grooves in place.
6. Mount the loading block. (See page 27.)

Notes:

1. Be careful not to scratch the teeth and grooves of the master cam.
2. After installation of the master cam, be sure to rotate the master cam by hand before installing the loading block. If the levers are in wrong position, the master cam and the levers may get damaged when the motor stares.
3. Apply specified grease to the master cam's grooves and teeth.

REPLACEMENT OF UPPER DRUM

Note:

The gap between the lower drum and the upper drum is very accurate, in the order of microns, and care should be paid to their replacement. Even a slight amount of foreign material will affect the accuracy of their reassembly.

- **Replacement (Follow the order of the indicated numbers.)**

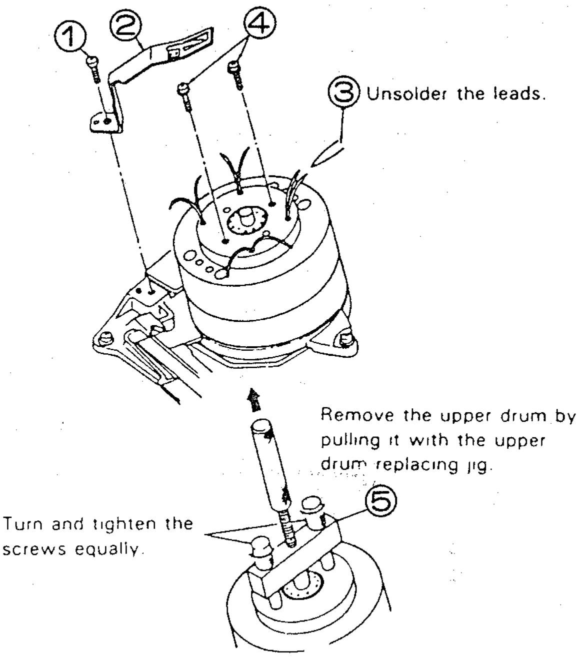

①
②
④
③ Unsolder the leads.
Remove the upper drum by pulling it with the upper drum replacing jig.
⑤
Turn and tighten the screws equally.

Figure 1-74.

Notes:

1. Avoid touching the drum surface with bare hands.
2. Pull out the upper drum with care so that it may not be tilted, and replace it with the upper drum replacing Jig using care not to damage the disk circumference.
3. Do not hit the screws when tightening them.

- Reassembly

Notes:

1. Before setting the drum, check that there are no scratches or dust on the edge of the surface and circumference of the disk.
2. Before setting the drum, check that there are no scratches or dust on the internal surface and edge of the surface of the upper drum.
3. On assembling these parts, insert the upper drum onto the disk with care, so that the upper drum is not tilted.
4. When assembling these parts, do not allow dust or dirt come between the disk and the upper drum.
5. Do not use excessive force when driving in the screws.

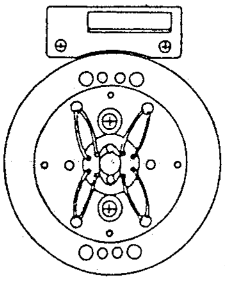


Figure 1-75.

1. Set the new drum.
2. Fasten the upper drum in place with the two screws.
3. Solder the leads.

   Note:

   Soldering should be performed quickly and carefully without touching adjacent patterns.
4. After replacement, be sure to check the tape drive train adjustment (see page 24.) and the following electric adjustments.

- Adjustment of the playback switching point.
- Checking and adjustment of the X-position
- Adjustment of SP and LP slow tracking preset.

REPLACEMENT OF D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

- **Removal (Reverse the order in reassembly.)**

1. Remove the FFC ①.
2. Remove the two D.D. rotor assembly setscrews ②.
3. Pull out the D.D. rotor ass'y ③.
4. Remove the three D.D. stator setscrews ④.
5. Remove the D.D. stator assembly ⑤.

Notes:

1. When removing the D.D. rotor assembly or D.D. stator assembly, use care not to hit the loading relay gear.
2. Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and lower drum assembly match.
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
5. After installation, adjust the playback switching point.

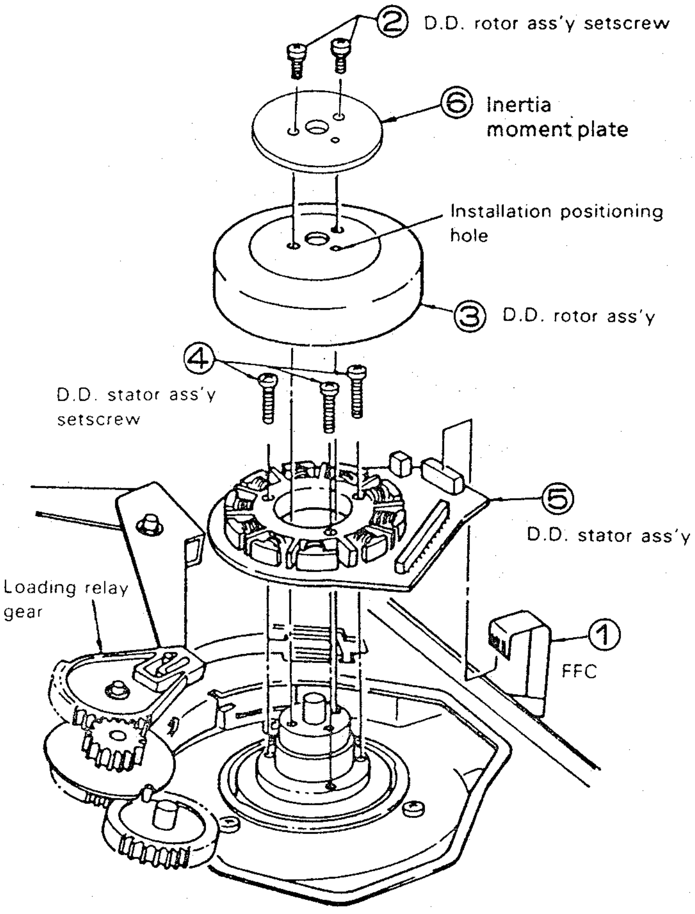

② D.D. rotor ass'y setscrew
⑥ Inertia moment plate
Installation positioning hole
③ D.D. rotor ass'y
④ D.D. stator ass'y setscrew
⑤ D.D. stator ass'y
Loading relay gear
① FFC

Figure 1-76.

REPLACING THE AHC (AUTOMATIC HEAD CLEANER)

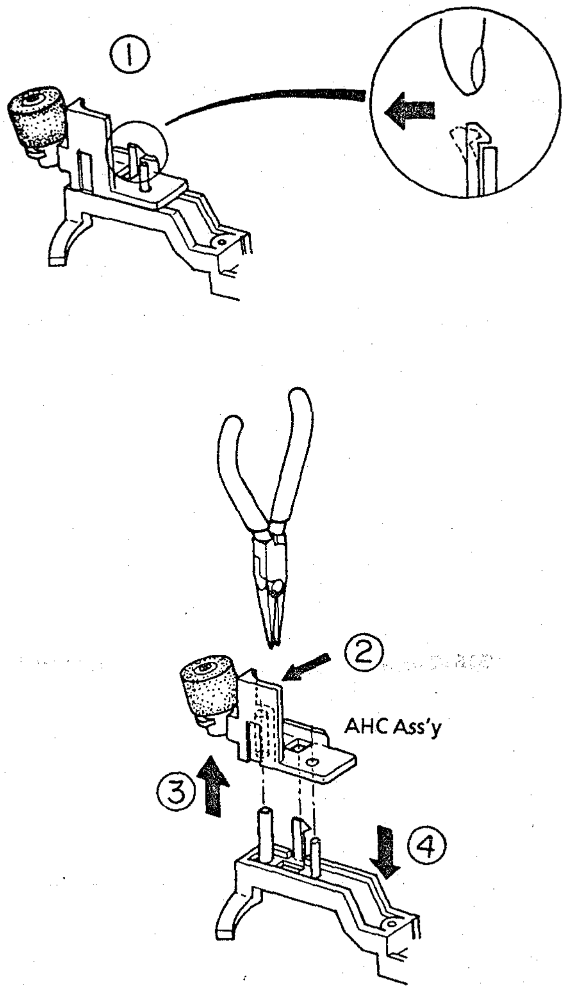


Figure 1-77.

- **Removal**

Unhook part ① with a finger in the direction of arrow.

Hold the rib (marked with an arrow) of the AHC ass'y ② with electrician's pliers or the like, and pull the ass'y upward in the direction of arrow ③.

Note:

To pull out the AHC ass'y, hold the AHC lever down.

- **Reassembly**

Push down the AHC ass'y in the direction of arrow ④. Make sure that the ass'y is secured in position by the hook of part ①.

Notes:

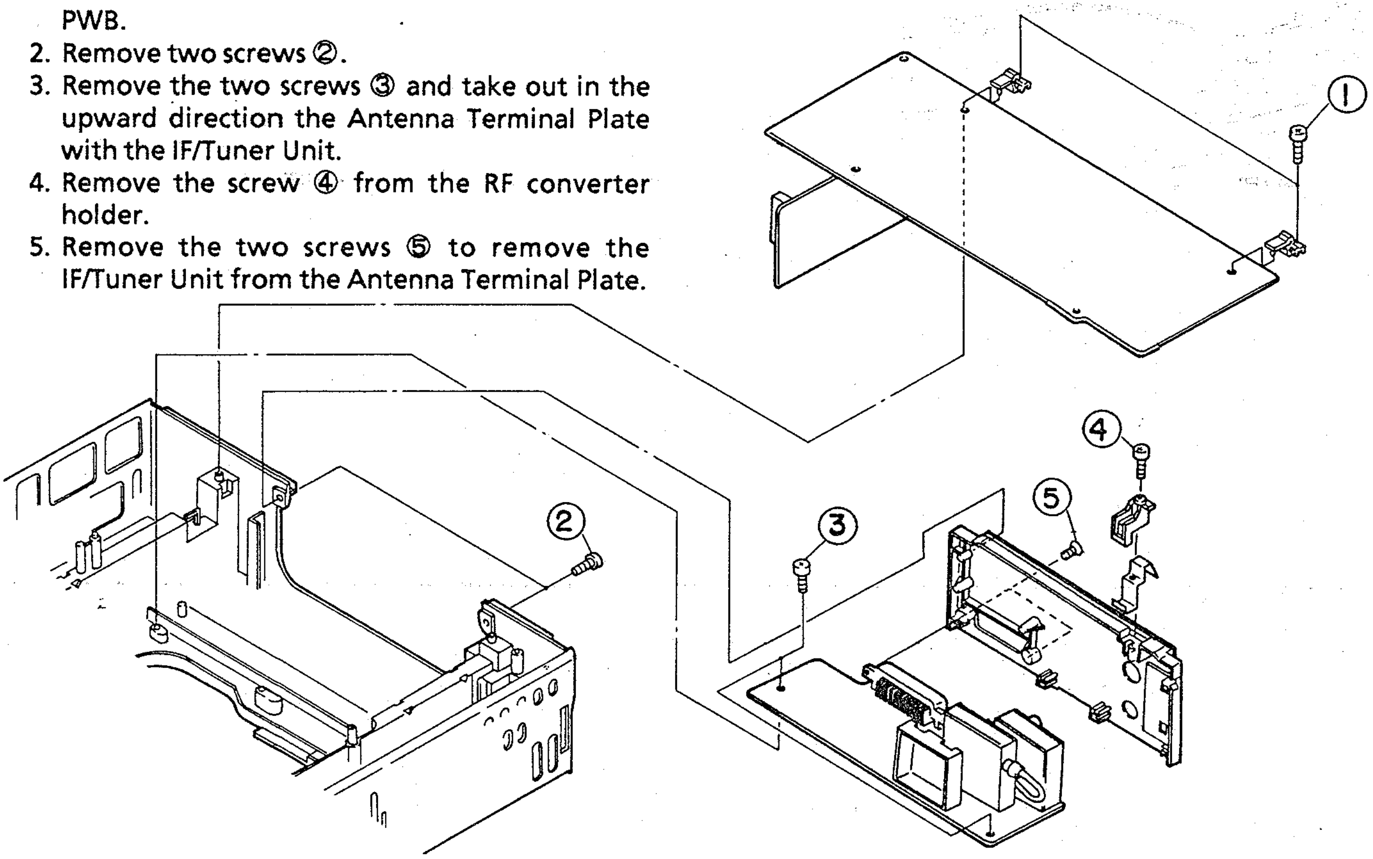
1. Be careful to keep the AHC ass'y out of contact with the drum.
2. Be careful to keep the cleaner section of the ass'y free of grease or contaminants.

ADJUSTMENT OF THE ELECTRICAL CIRCUITRY

▩ DISASSEMBLY OF IF/TUNER AND POWER UNITS

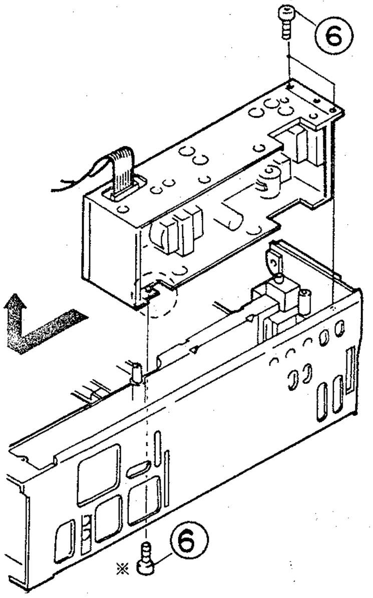
IF/Tuner Unit

1. Remove two screws ① which fasten the Main PWB.
2. Remove two screws ②.
3. Remove the two screws ③ and take out in the upward direction the Antenna Terminal Plate with the IF/Tuner Unit.
4. Remove the screw ④ from the RF converter holder.
5. Remove the two screws ⑤ to remove the IF/Tuner Unit from the Antenna Terminal Plate.



Power Unit

1. Remove three screws ⑥ which fasten the Power Unit.
2. Slide the Power Unit in the direction of the arrow to uncouple it from the main frame, and remove the Power Unit in the upward direction.

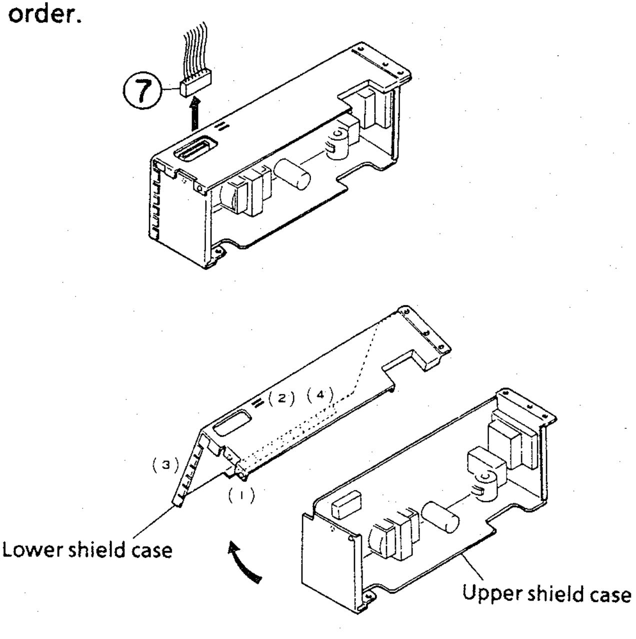


Note:
The screw marked (※) is used to tighten up the bottom plate.

Power Unit Shield Case

1. Remove the wire lead with Connector PA ⑦.
2. Hold the Upper Shield Case down and remove the Lower one by turning it in the direction of the arrow.

Note:
For easier coupling, fit at locations (1) to (4) in this order.



Prior to the adjustment:
In most cases, necessity for electrical circuits will arise from replacement of mechanical parts including the video head. Before starting adjustment of electrical circuits, check that mechanical operation of the equipment is complete (the mechanism are adjusted completely).

If the equipment fails electrically, locate a defect or defects first of all using instruments. Then repair or replace parts and make adjustment by the procedures described below.
When required instruments are not available, do not move controls indiscriminately.

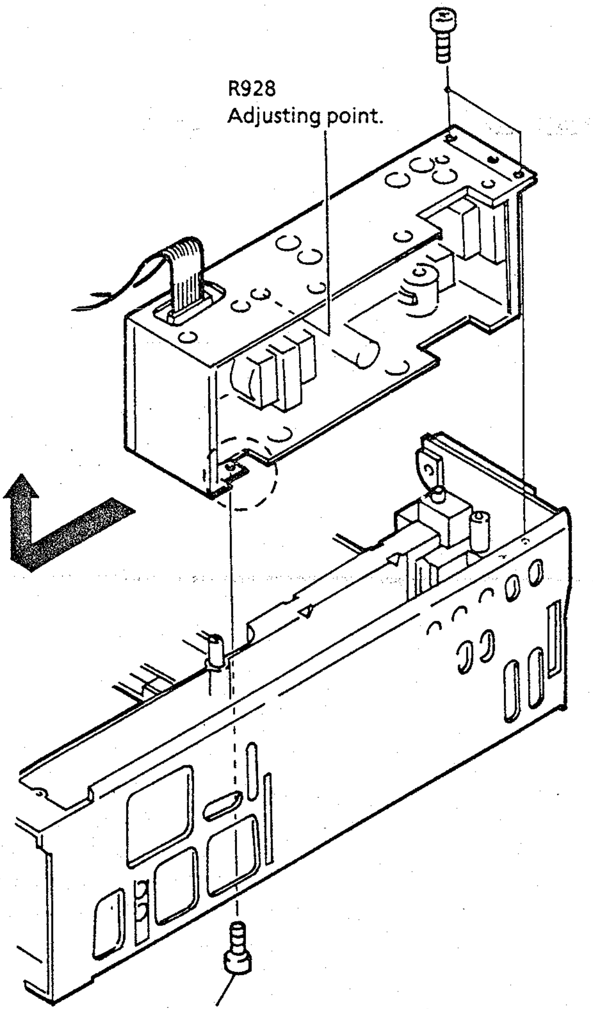
- **Instruments**
  - Colour monitor TV
  - DC regulated power supply
  - VTVM
  - Oscilloscope
  - Audio generator
  - Connector (QCNW-6443GEZZ)
  - Colour bar generator
  - Alignment tape
  - Frequency counter
  - Blank video tape(VHS)

▨ ADJUSTMENT OF POWER CIRCUIT

Adjustment of power circuit (UR6.5V)

Measuring instrument	Voltmeter
Mode	Recording (SP mode)
Test point	Pin 4 of AP connector located on the Main PWB.
Control	R928
Adjusting point	6.6 ± 0.1 V

1. Remove the AC cord.
2. Remove the three power unit fastening screws. Lift up the power unit from front side and move it toward ⇦ direction.
3. Connect the AC cord and power supply.
4. Connect the voltmeter to Pin 4 of AP connector and Ground. (AP connector located on the MAIN PWB.)
5. Set the unit in the recording mode. Adjust R928 so that the voltmeter reads 6.6 ± 0.1V.



R928
Adjusting point.

This screw is used to tighten up the bottom plate.

Figure 2-1. POWER PWB

■ ADJUSTMENT OF SYSTEM CONTROL/SERVO CIRCUIT

- **Test points layout**

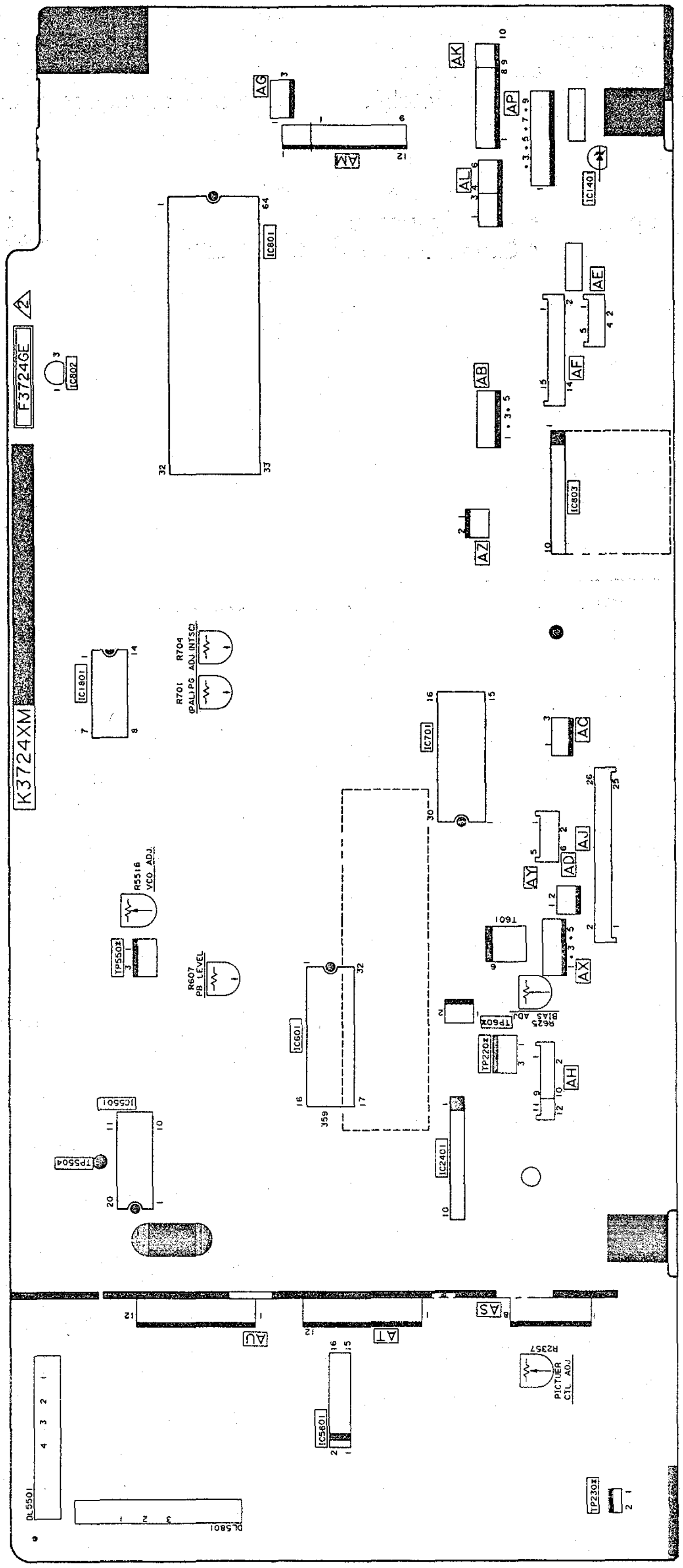

AK
AG
AM
AP
AL
IC1401
IC801
AE
AF
AB
F3724GE
IC802
IC803
AZ
R704 ADJ (NTSC)
R701 (PAL) PG
IC1801
K3724XM
IC701
AC
AJ
AD
AY
R5516 VCO ADJ
TP5501
R607 PB LEVEL
T601
AX
R625 BIAS ADJ
TP601
TP2201
AH
IC601
IC2401
IC5501
TP5504
AU
AT
AS
R2357 PICTURE CTL ADJ
IC5601
DL5501
DL5801
TP2301

Figure 2-2. MAIN PWB

ADJUSTMENT OF SERVO CIRCUIT

Adjustment of PAL system playback switching point

Measuring instrument	Oscilloscope
Mode	Playback (Tracking at center)
Tape used	Alignment tape (VROCPSV)
Test point	CH-1; TP2202 CH-2; Video output terminal (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side)
Control	R701 (Phase generator M.M.)
Specification	6.5 ± 0.5H

1. Insert the PAL system alignment tape (VROCPSV) and put the unit in the playback mode.
2. Press the unit to tracking in the center mode. (See note below.)
3. Adjust R701 (phase generator M.M.) so that the waveform on the oscilloscope screen be as shown Figure 2-3.

Note:

How to tracking in the center mode.

1. Remove the cassette housing.
2. Press the test button on the located on the timer PWB.

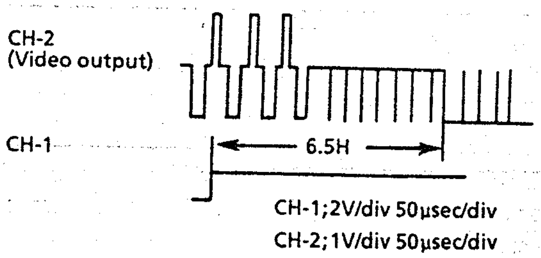


Figure 2-3.

Adjustment of PAL system SP/LP slow tracking.

Measuring instrument	Monitor TV
Mode	Recording and playback on self-recording tape.
Input signal	Commercial broadcast or video signal. (External input selector switch)
Test Point	Monitor screen
Adjusting point	Tracking control button (+) or (−)
Specification	No noise bar on the monitor TV screen

1. Play back the self-recording tape in the PAL system SP/LP mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the slow button and playback the recorded portion in the slow mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller so that there is no noise on the screen.
6. Press the stop button in the slow tracking preset data are memorized.
7. Press the all clear button in the return to normal mode.

Adjustment of still picture vertical sync.

Measuring instrument	Monitor TV
Mode	Still picture playback
Input signal	Self-recording tape
Test point	Monitor screen
Adjusting point	Tracking control button (+) or (−)
Specification	No noise jitter

1. Play back the self-recording tape in the PAL system SP mode.
2. Press the test button so that the test mode.
3. Be sure that all the fluorescent display tubes light up.
4. Press the still button and playback the recorded portion in the SP mode.
5. Adjust the tracking control using the tracking button on the main unit or the remote controller, make adjustment so that jitter becomes minimum.
6. Press the stop button in the still preset data are memorized.
7. Press the all clear button in the return to normal mode.

▩ ADJUSTMENT OF Y/C CIRCUIT

- Test point layout

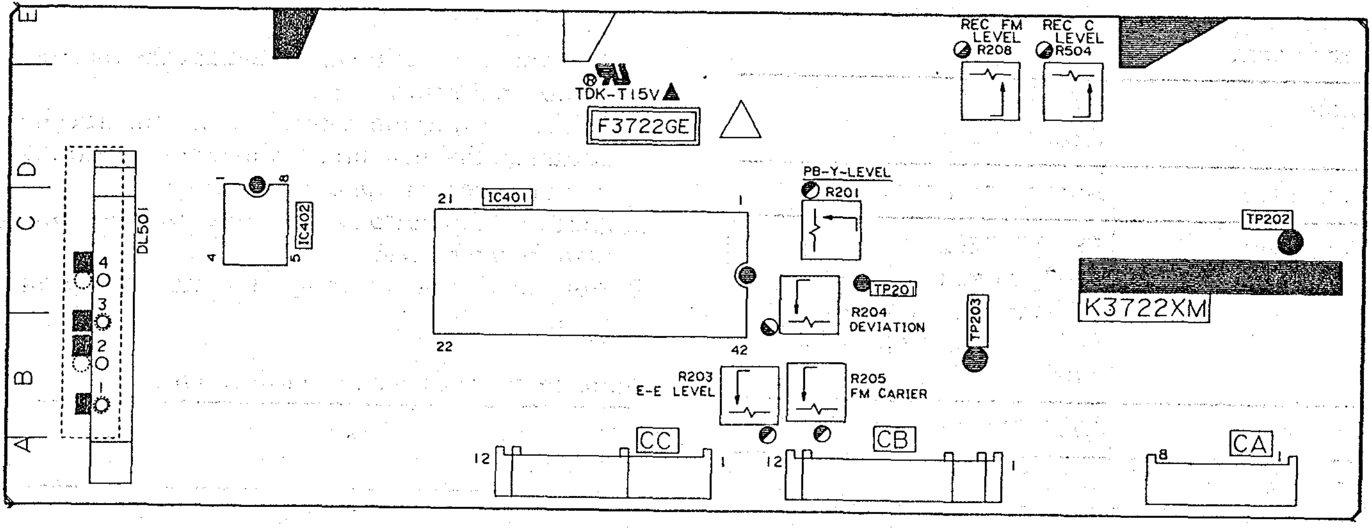

E
D
C
B
A
DL501
4
3
2
1
IC402
8
4
5
IC401
21
1
22
42
TDK-T15V
F3722GE
REC FM LEVEL
R208
REC C LEVEL
R504
PB-Y-LEVEL
R201
TP202
TP201
R204
DEVIATION
TP203
K3722XM
R203
E-E LEVEL
R205
FM CARIER
CC
12
1
CB
12
1
CA
8
1

Figure 2-4. Y/C PWB

Adjustment of EE level

Measuring instrument	Oscilloscope
Mode	EE or Record
Input signal	Standard colour bar (stair-case waveform)
Test point	Video output terminal
Adjusting point	R203 (EE level control)
Specification	1.0 ± 0.06 Vp-p

1. Connect a 75 ohm resistor to the video output terminal and hook the oscilloscope across this resistor. (See note below.)
2. Feed the colour bar signal to the video input terminal in the EE or recording mode.
3. Adjust R203 so that the signal amplitude is 1.0 Vp-p as shown in Figure 2-5.

Note:
If the terminating resistor is missing, the signal amplitude will be doubled.

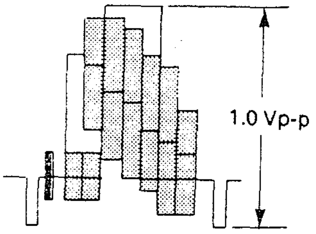


Figure 2-5.

Adjustment of playback video signal level

Measuring instrument	Oscilloscope
Mode	Playback
Tape used	Alignment tape (VROCPSV) (stair-case waveform)
Test point	Video output terminal
Adjusting point	R201 (Playback Y-level control)
Specification	1.0 ± 0.06 Vp-p

1. Connect a 75 ohm resistor to the video output terminal and connect an oscilloscope across this resistor. (See note below.)
2. Play the colour bar portion of the alignment tape and adjust R201 so that the signal amplitude is measured 1.0 Vp-p on the oscilloscope as shown in Figure 2-6.

Note:
If the terminating resistor is missing, the signal amplitude will be doubled.

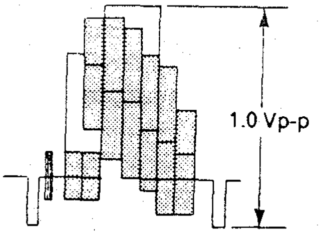


Figure 2-6.

Adjustment of FM carrier and deviation

Measuring instrument	Frequency counter, Oscilloscope
Mode	Record/Playback (LP mode)
Input signal	Standard colour bar (stair-case waveform)
Test point	TP301 (GND at TP302) Video output terminal
Adjusting point	R205 (FM carrier control) R204 (Deviation control)
Specification	3.8 ± 0.05 MHz 1.0 ± 0.04 Vp-p

1. Make sure that R203 (E-E level) and R201 (playback Y-Level) have been correctly adjusted.
2. Connect a 75 ohm terminating resistor to the video output terminal and connect an oscilloscope across this resistor.
3. Connect a frequency counter to TP301 and TP302.
4. Place the unit in record mode and get it ready for external input with no signal. (Disconnect any cable from video input terminal.)
5. Adjust R205 so that the frequency counter reading be 3.8 MHz.
6. Feed the standard colour bar signal (stair-case waveform) and make self-recording and playback.
7. Observe the video output terminal voltage (across the terminal resistor) on the oscilloscope screen. If the playback video signal level is above 1.0 Vp-p, turn R204 clockwise.
   If below 1.0 Vp-p, turn the control counter clockwise. Now make self-recording and playback again.
8. Repeat the above step 7 to finally get the playback video signal level at 1.0 ± 0.04 Vp-p, as shown in Figure 2-7.

Notes:

1. Carry out this adjustment only when IC401 has been replaced or when the carrier setting (3.8 MHz) or the deviation is found apparently out of specification.
2. If the terminating resistor is missing, the signal amplitude will be doubled.

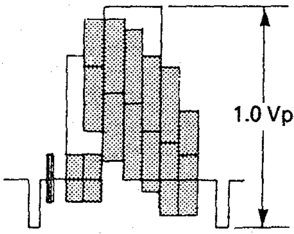
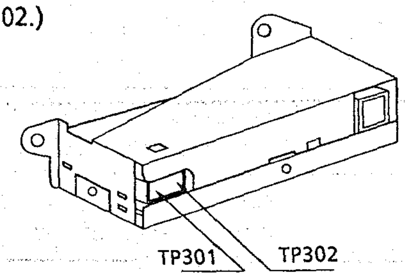


Figure 2-7.

Adjustment of recording current

Measuring instrument	Oscilloscope
Mode	Record (LP mode)
Input signal	Standard colour bar (stair-case waveform)
Test point	TP301, TP302 (GND) [External trigger: Video output terminal]
Adjusting point	R504 (Record Chroma Level Control) R208 (Record FM level control)
Specification	22 ± 2 mVp-p (Chroma) 80 ± 10 mVp-p (FM-Y)

1. Feed the standard colour bar signal (stair-case waveform) to the video input terminal.
2. Connect the oscilloscope's GND and SIG leads to TP302 and TP301, respectively.
   (for convenient connection of the oscilloscope, use QCNW-6443GEZZ.)
3. Set the unit to LP recording mode.
4. Turn R208 to minimize the FM luminance signal.
5. Adjust R504 so that the amplitude of red portion is 22 ± 2 mVp-p as shown in Figure 2-8.
6. Adjust R208 so that the amplitude of sync tip portion is 80 ± 10 mVp-p as shown in Figure 2-9.
7. Remove QCNW-6443GEZZ after adjustment.
   (Also remove connecting probe of TP301 and TP302.)



Note:
TP301 and TP302 are located on the head amp module.

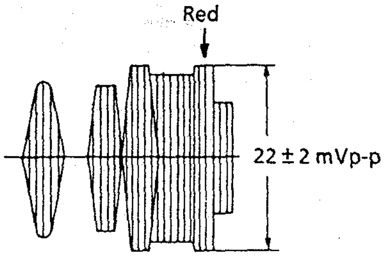


Figure 2-8.

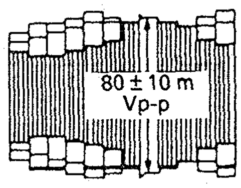


Figure 2-9.

■ ADJUSTMENT OF AUTO PICTURE CONTROL CIRCUIT

● Test points layout

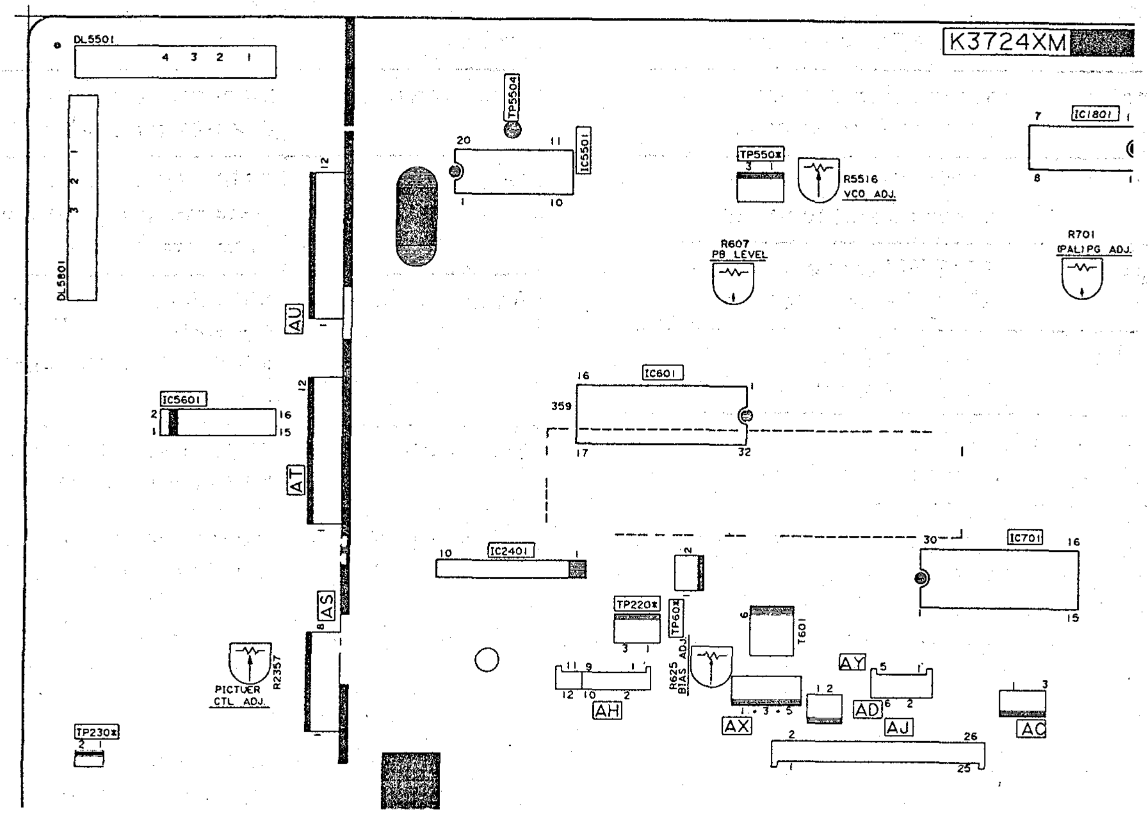

K3724XM
DL5501
4 3 2 1
DL5801
TP5504
IC5501
TP550✱
R5516
VCO ADJ.
IC1801
R701
(PAL) PG ADJ.
R607
PB LEVEL
AU
IC5601
AT
IC601
359
IC2401
IC701
AS
TP220✱
TP60✱
T601
R625
BIAS ADJ.
AH
AX
AY
AD
AJ
AC
PICTUER
CTL ADJ.
R2357
TP230✱

Figure 2-10. MAIN PWB

Adjustment of auto picture control

Measuring instrument	Digital volt meter
Mode	SP Recording and playback on self-recording tape
Input signal	Standard colour bar (stair-case waveform)
Test point	TP2301 (SIG), TP2302 (GND)
Adjusting point	R2357 (Picture control)
Specification	2.5 ± 0.1 V

1. Playback the tape self-recorded. (Colour bar signal.)
2. Set the auto picture switch to "ON" or "AUTO PICTURE" position and picture tone volume in center.
3. Connect the digital volt meter to TP2301 (SIG) and TP2302 (GND). Adjust R2357 so that the digital volt meter reads 2.5 ± 0.1 V.

■ ADJUSTMENT OF AUDIO CIRCUIT

● Test point layout

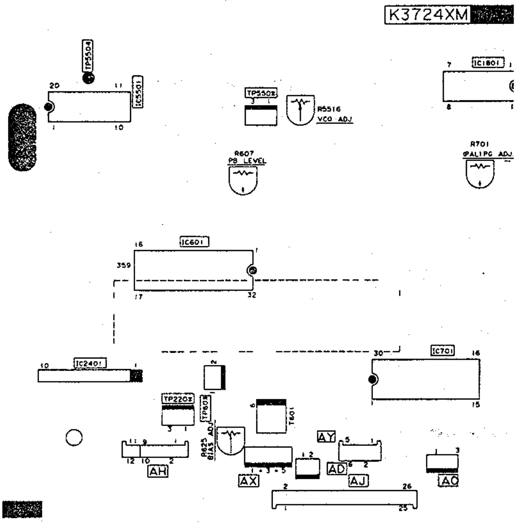

K3724XM
TP5504
IC5501
20
11
1
10
TP5502
3
1
R5516
VCO ADJ
IC1801
7
8
R607
PB LEVEL
R701
PAL1PG ADJ
IC601
16
1
359
17
32
IC2401
10
1
2
1
30
IC701
16
1
15
TP2202
3
1
TP603
R625
BIAS ADJ
T601
6
11
9
1
12
10
2
AH
1
3
5
AX
1
2
AY
5
1
AD
6
2
AJ
2
26
1
25
1
3
AQ

Figure 2-11. MAIN PWB

Adjustment of playback level

Measuring instrument	VTVM
Mode	Playback
Input signal	Alignment tape (VROCPSV) (1kHz level control signal)
Test point	Audio output terminal
Adjusting point	R607 (Playback level control)
Specification	– 9 ± 1 dBs

1. Play back the alignment tape (1kHz level control signal).
2. Hook up the VTVM to the audio output terminal.
3. Adjust R607 (playback level control) so that the output level be – 9 ± 1 dBs.

Checking of erase voltage and oscillation frequency

Measuring instrument	Oscilloscope
Mode	Recording
Input signal	————
Test point	Both ends of the full-erase head
Adjusting point	————
Specification	Erase voltage; Over 40 Vp-p Oscillation frequency; 70 ± 5kHz

1. Place the unit to the record mode.
2. Hook up the oscilloscope to both ends of the full-erase head.
3. Make sure the erase voltage is over 40 Vp-p.
4. Be sure that the oscillation frequency is 70 ± 5kHz.

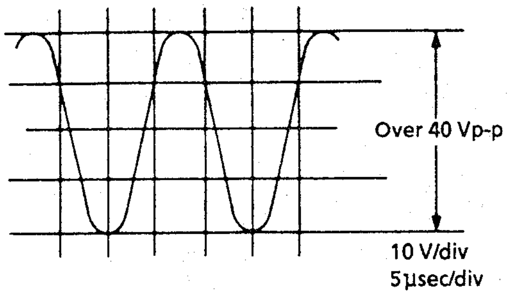


Figure 2-12.

Adjustment of bias current

Measuring instrument	VTVM
Mode	Recording
Input signal	————
Test point	TP601 (SIG), TP602 (GND)
Adjusting point	R625 (Bias current control)
Specification	280 ± 10µA

1. Place the unit to the record mode.
2. Connect the VTVM to TP601 (SIG) and TP602 (GND).
3. Adjust R625 (bias current control) so that the bias current be 280 ± 10µA (2.8 ± 0.1mV).

Checking of recording level

Measuring instrument	VTVM
Mode	Self-recording/playback
Input signal	1 kHz / –3.8 dBs
Test point	Audio output terminal
Adjusting point	————
Specification	1 kHz – 3.8 ± 3 dBs

1. Feed 1 kHz, – 3.8 dBs signal to the audio input terminal. Make self-recording and playback of the signal.
2. Make sure the output at the Audio output terminal is 1 kHz – 3.8 ± 3 dBs.
3. If out of spec, readjust the playback level and the bias current.

▩ ADJUSTMENT OF THE IF CIRCUIT

Adjustment of the RF AGC

Measuring instrument	Oscilloscope Signal generator
Mode	EE
Input signal	Colour bar signal
Test point	TP1551 (GND) TP1552 (Video output)
Adjusting point	VR001 (AGC control)

1. Receive the colour bar signal (input field strength: 80 dBµ).
2. Observe the video output terminal waveform on the oscilloscope. Adjust VR001 (AGC control) in the IF pack until the noise disappears from the oscilloscope screen and the waveform nearly comes into sync.

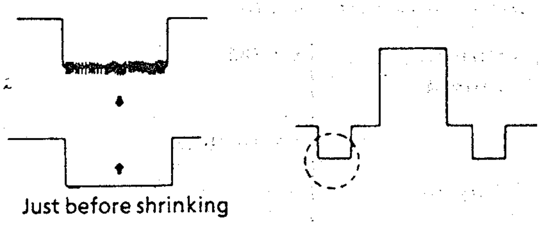


Figure 2-13.

Adjustment of the AFT

Measuring instrument	Oscilloscope Signal generator
Mode	EE
Input signal	PIF frequency uniwave Colour bar signal (70 dBµ)
Test point	TP1551 (GND) TP1552 (Video output)
Adjusting point	T002 (AFT coil)
Specification	————

1. Receive the colour bar signal (input field strength: 70 dBµ).
2. Using the signal generator, feed the PIF frequency (38.9 MHz) signal (sinewave) to the tuner IF output terminal.
3. Set the tuning switch to the VHF or UHF position. Keep the tuning button (+) or (−) depressed until the beating on the oscilloscope screen be minimum.
4. Set the tuning switch on the normal position. Adjust the T002 (AFT coil) so that beating on the oscilloscope screen be minimum.

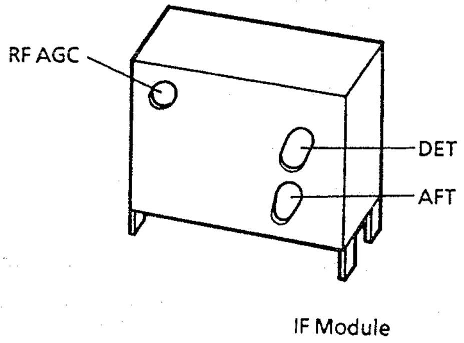


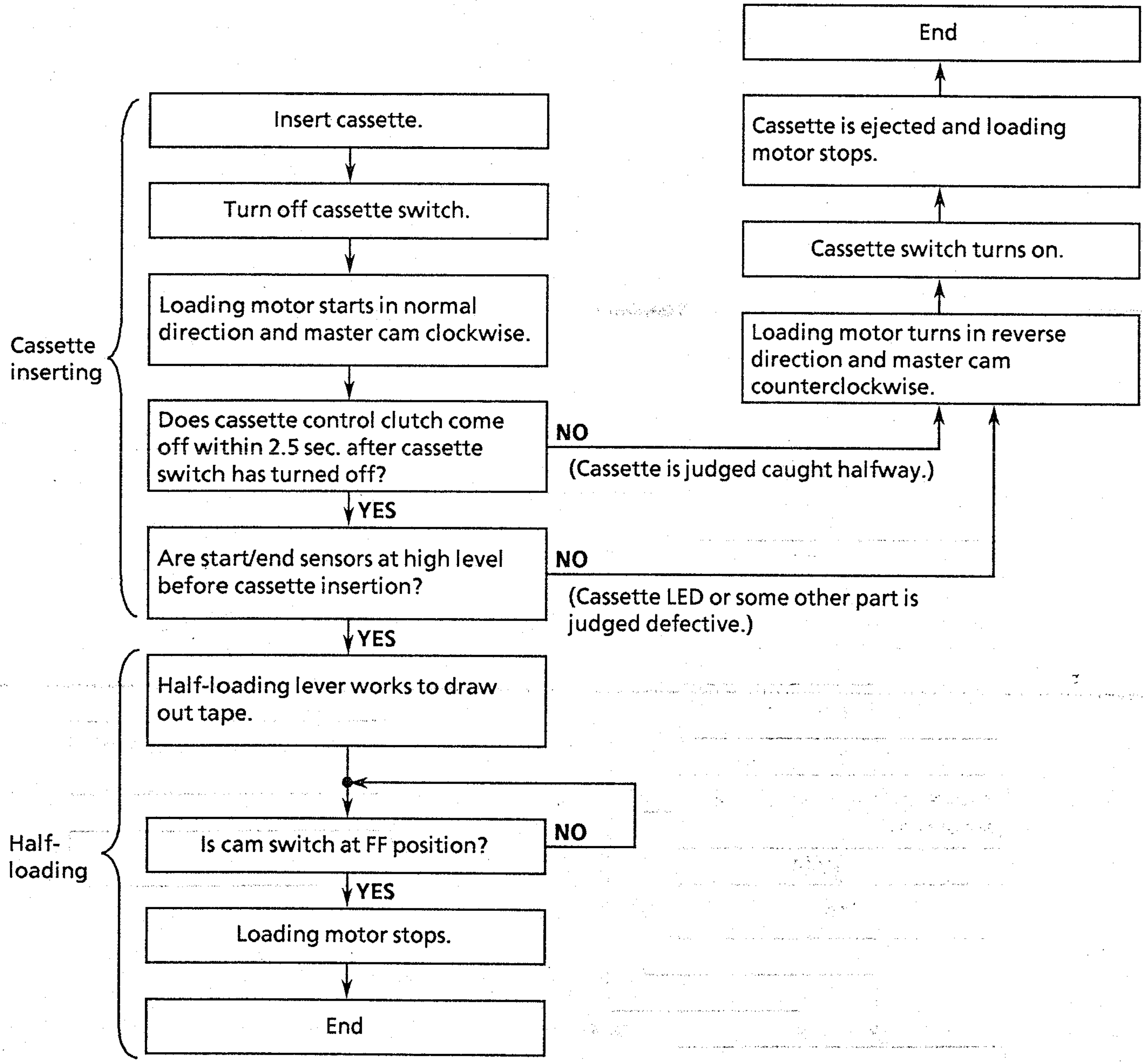
Figure 2-14.

MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE

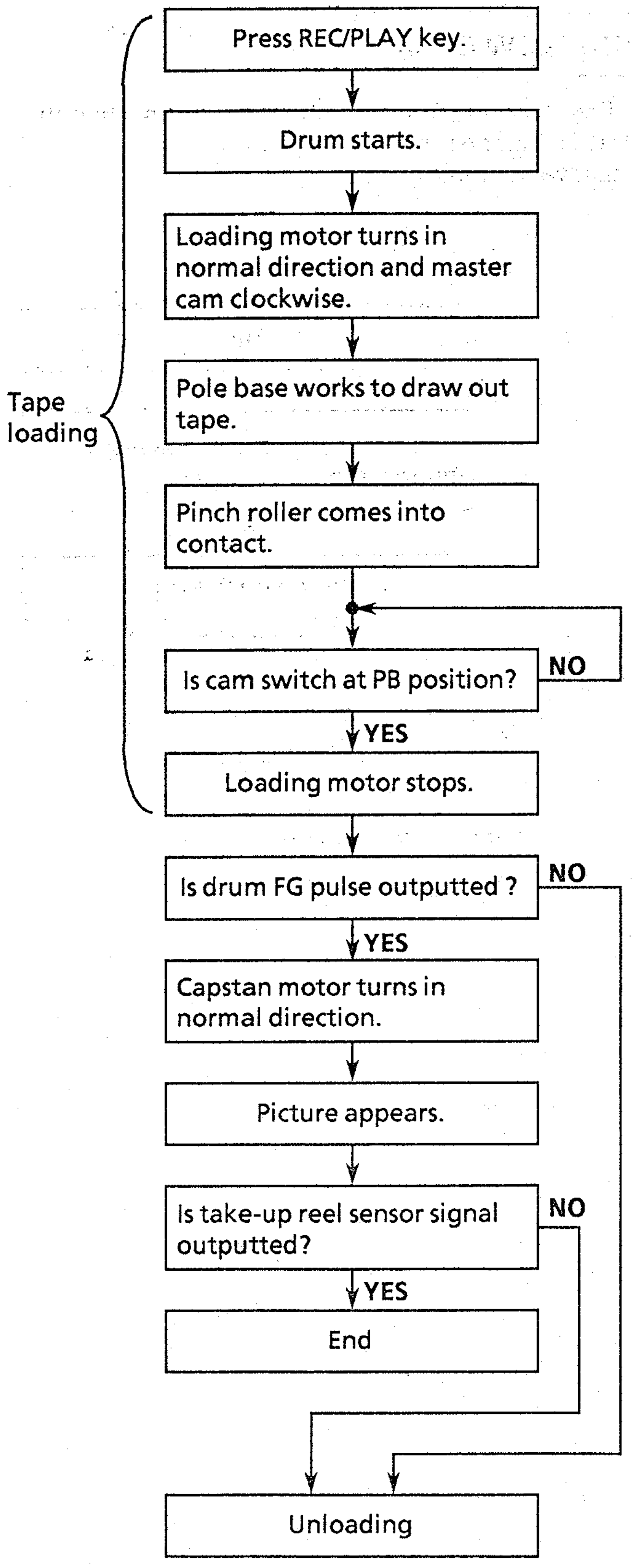
MECHANISM OPERATION FLOW CHART

* This flow chart describes the outline of the mechanism's operation, but does not give its details.
* For cam switch positions, see Fig. 3-2.

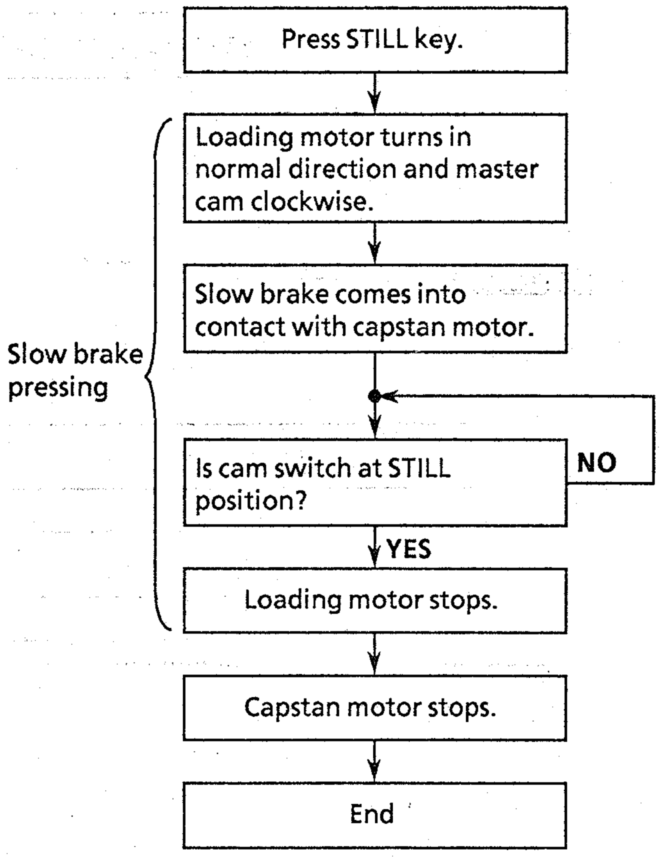
CASSETTE INSERTION → STOP


Cassette inserting
Insert cassette.
Turn off cassette switch.
Loading motor starts in normal direction and master cam clockwise.
Does cassette control clutch come off within 2.5 sec. after cassette switch has turned off?
NO
(Cassette is judged caught halfway.)
YES
Are start/end sensors at high level before cassette insertion?
NO
(Cassette LED or some other part is judged defective.)
YES
Half-loading
Half-loading lever works to draw out tape.
Is cam switch at FF position?
NO
YES
Loading motor stops.
End
Loading motor turns in reverse direction and master cam counterclockwise.
Cassette switch turns on.
Cassette is ejected and loading motor stops.
End

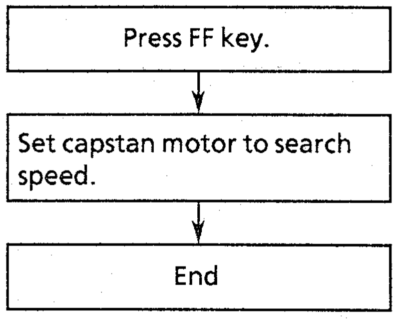
STOP → REC/PLAY


Press REC/PLAY key.
Drum starts.
Loading motor turns in normal direction and master cam clockwise.
Pole base works to draw out tape.
Pinch roller comes into contact.
Is cam switch at PB position?
NO
YES
Loading motor stops.
Tape loading
Is drum FG pulse outputted ?
NO
YES
Capstan motor turns in normal direction.
Picture appears.
Is take-up reel sensor signal outputted?
NO
YES
End
Unloading

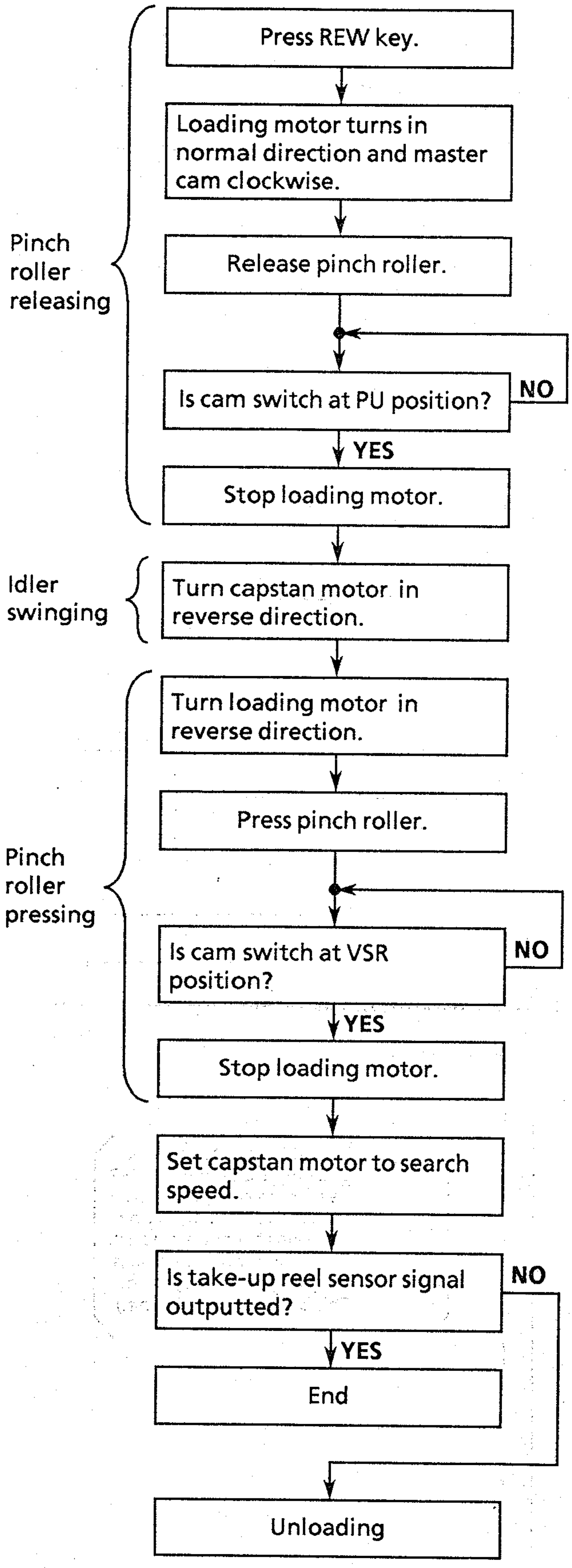
PLAY → STILL


Press STILL key.
Loading motor turns in normal direction and master cam clockwise.
Slow brake comes into contact with capstan motor.
Slow brake pressing
Is cam switch at STILL position?
NO
YES
Loading motor stops.
Capstan motor stops.
End

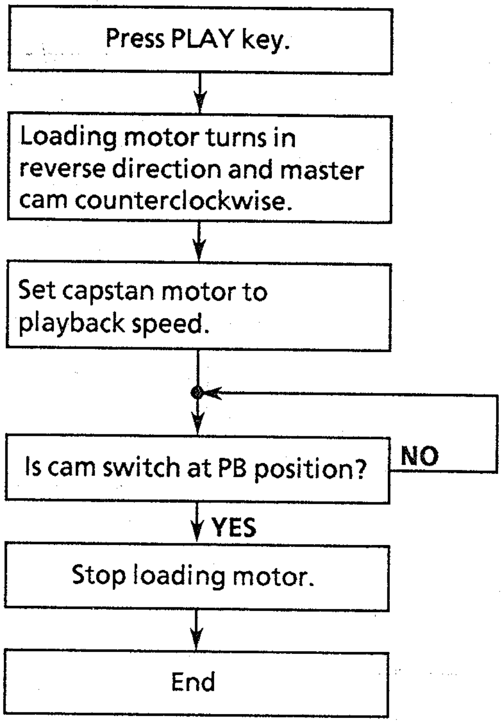
PLAY → VSF


Press FF key.
Set capstan motor to search speed.
End

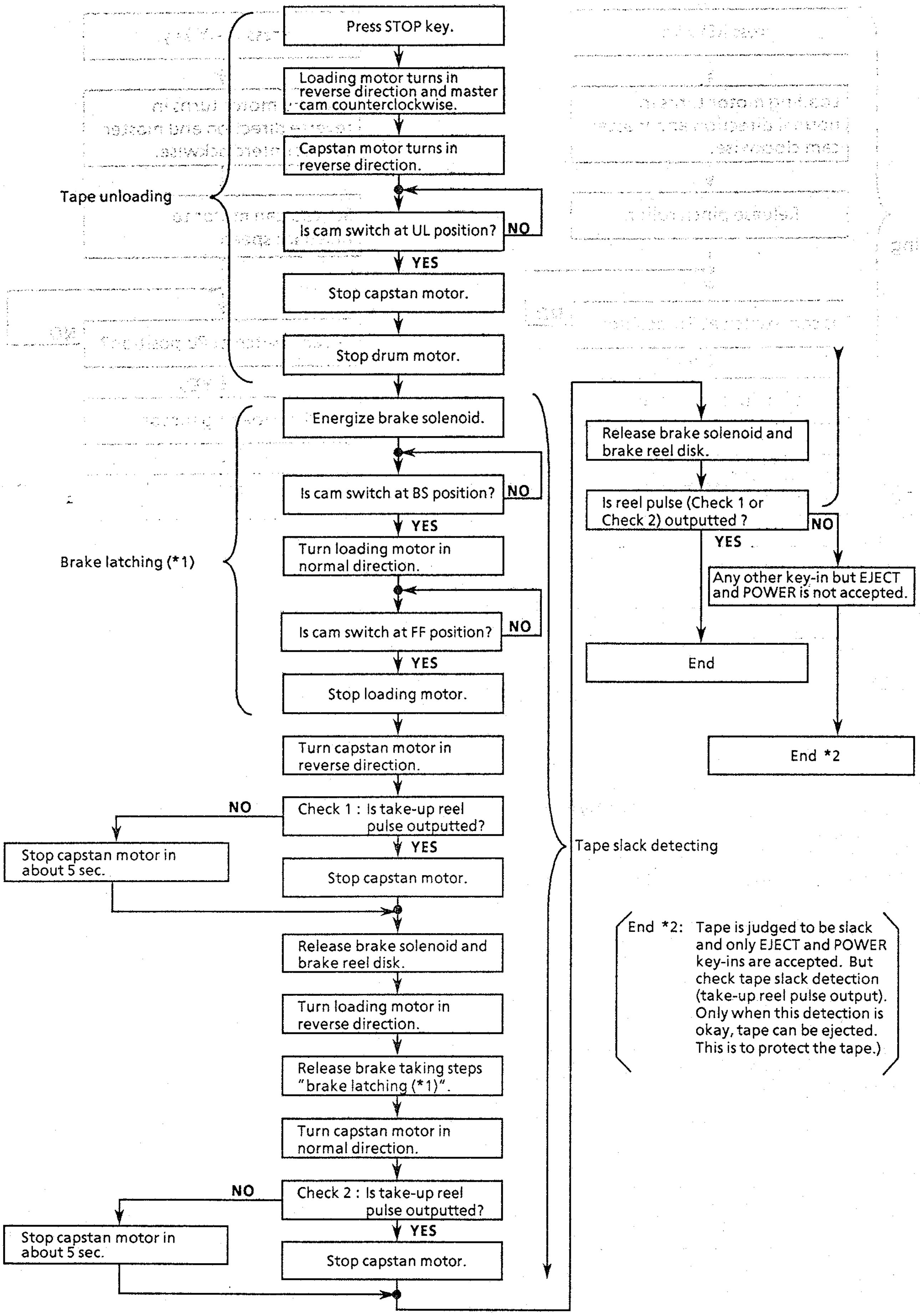
PLAY → VSR


Pinch roller releasing
Press REW key.
Loading motor turns in normal direction and master cam clockwise.
Release pinch roller.
Is cam switch at PU position?
NO
YES
Stop loading motor.
Idler swinging
Turn capstan motor in reverse direction.
Pinch roller pressing
Turn loading motor in reverse direction.
Press pinch roller.
Is cam switch at VSR position?
NO
YES
Stop loading motor.
Set capstan motor to search speed.
Is take-up reel sensor signal outputted?
NO
YES
End
Unloading

VSR → PLAY

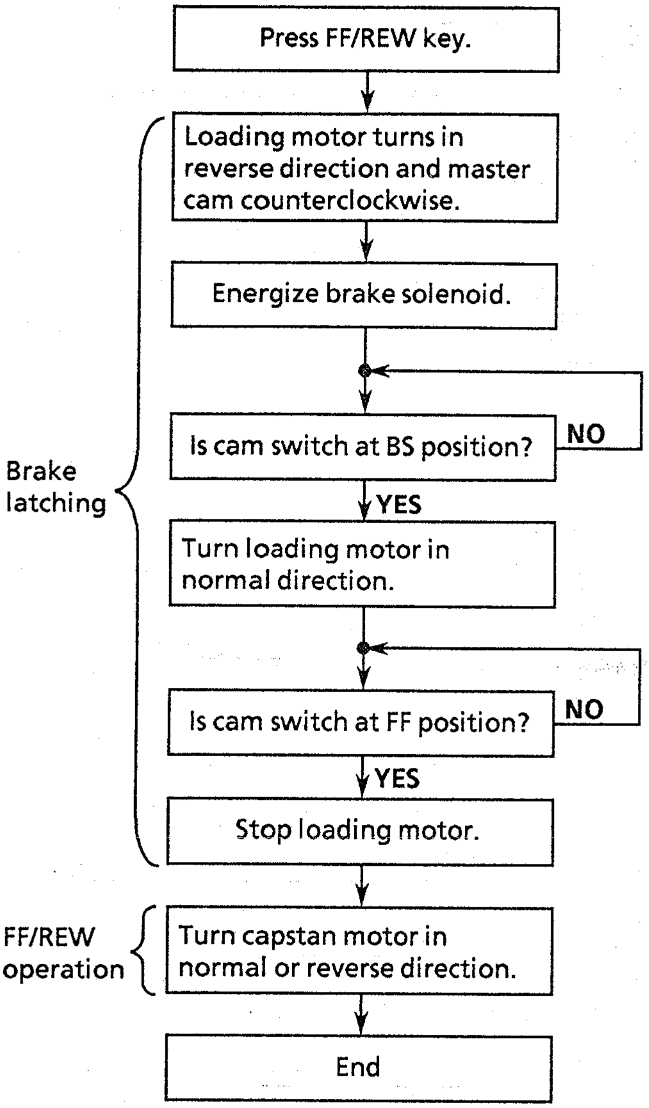

Press PLAY key.
Loading motor turns in reverse direction and master cam counterclockwise.
Set capstan motor to playback speed.
Is cam switch at PB position?
NO
YES
Stop loading motor.
End

REC/PLAY → STOP

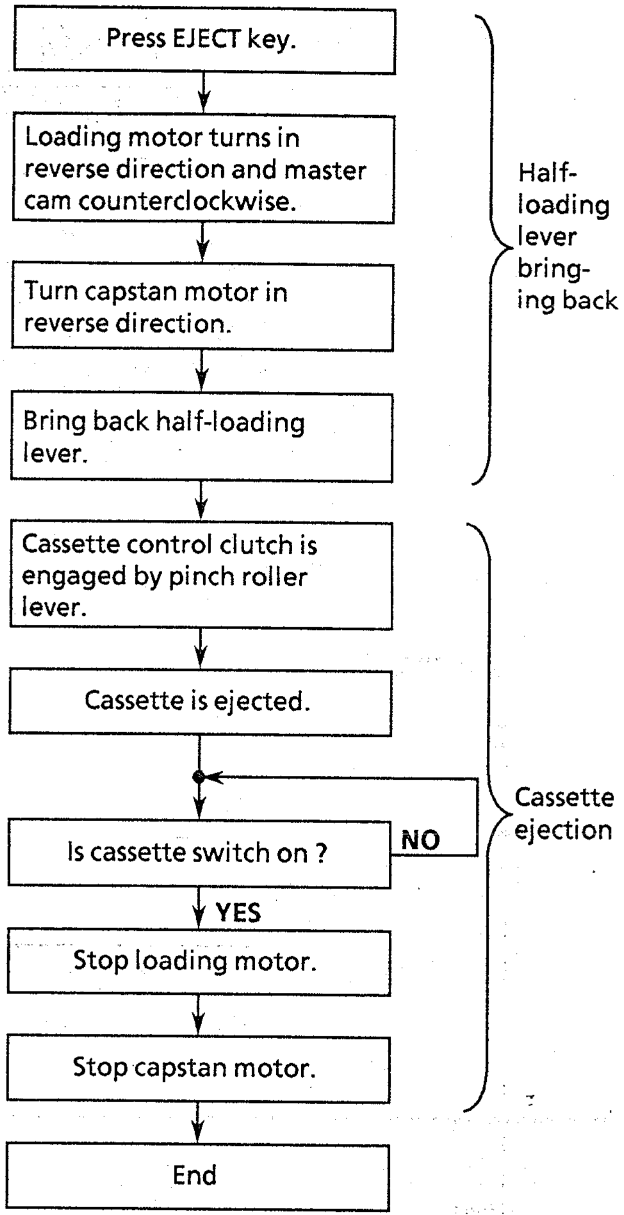

Press STOP key.
Loading motor turns in reverse direction and master cam counterclockwise.
Capstan motor turns in reverse direction.
Is cam switch at UL position?
NO
YES
Stop capstan motor.
Stop drum motor.
Tape unloading
Energize brake solenoid.
Is cam switch at BS position?
NO
YES
Turn loading motor in normal direction.
Is cam switch at FF position?
NO
YES
Stop loading motor.
Brake latching (*1)
Turn capstan motor in reverse direction.
Check 1 : Is take-up reel pulse outputted?
NO
Stop capstan motor in about 5 sec.
YES
Stop capstan motor.
Release brake solenoid and brake reel disk.
Turn loading motor in reverse direction.
Release brake taking steps "brake latching (*1)".
Turn capstan motor in normal direction.
Check 2 : Is take-up reel pulse outputted?
NO
Stop capstan motor in about 5 sec.
YES
Stop capstan motor.
Tape slack detecting
Release brake solenoid and brake reel disk.
Is reel pulse (Check 1 or Check 2) outputted ?
NO
YES
Any other key-in but EJECT and POWER is not accepted.
End
End *2

End *2: Tape is judged to be slack and only EJECT and POWER key-ins are accepted. But check tape slack detection (take-up reel pulse output). Only when this detection is okay, tape can be ejected. This is to protect the tape.)

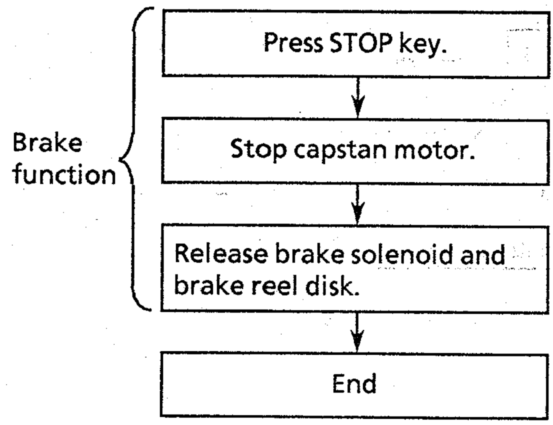
STOP → FF/REW


Press FF/REW key.
Loading motor turns in reverse direction and master cam counterclockwise.
Energize brake solenoid.
Is cam switch at BS position?
NO
YES
Turn loading motor in normal direction.
Is cam switch at FF position?
NO
YES
Stop loading motor.
Turn capstan motor in normal or reverse direction.
End
Brake latching
FF/REW operation

STOP → CASSETTE EJECT


Press EJECT key.
Loading motor turns in reverse direction and master cam counterclockwise.
Turn capstan motor in reverse direction.
Bring back half-loading lever.
Half-loading lever bringing back
Cassette control clutch is engaged by pinch roller lever.
Cassette is ejected.
Is cassette switch on ?
NO
YES
Stop loading motor.
Stop capstan motor.
Cassette ejection
End

FF/REW → STOP


Press STOP key.
Stop capstan motor.
Release brake solenoid and brake reel disk.
End
Brake function

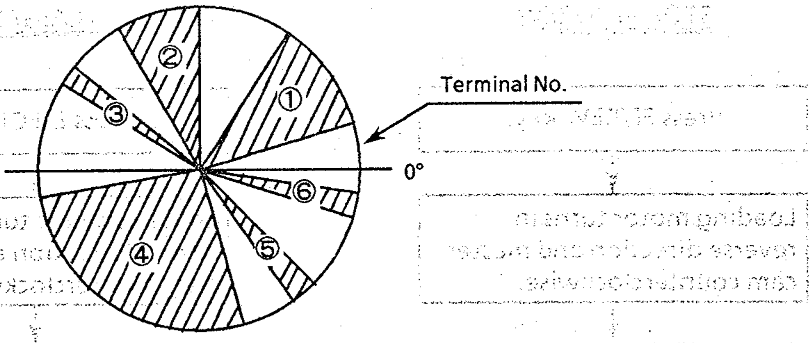

②
①
③
Terminal No.
0°
⑥
④
⑤

Fig. 3-1 Cam switch pattern

* The cam switch has the pattern as shown in Fig. 3-1. The circuit turns on when the signal comes on the shaded zones on the switch. The six pattern signals are judged to be on or off by the system controller in order to detect the mechanism modes.

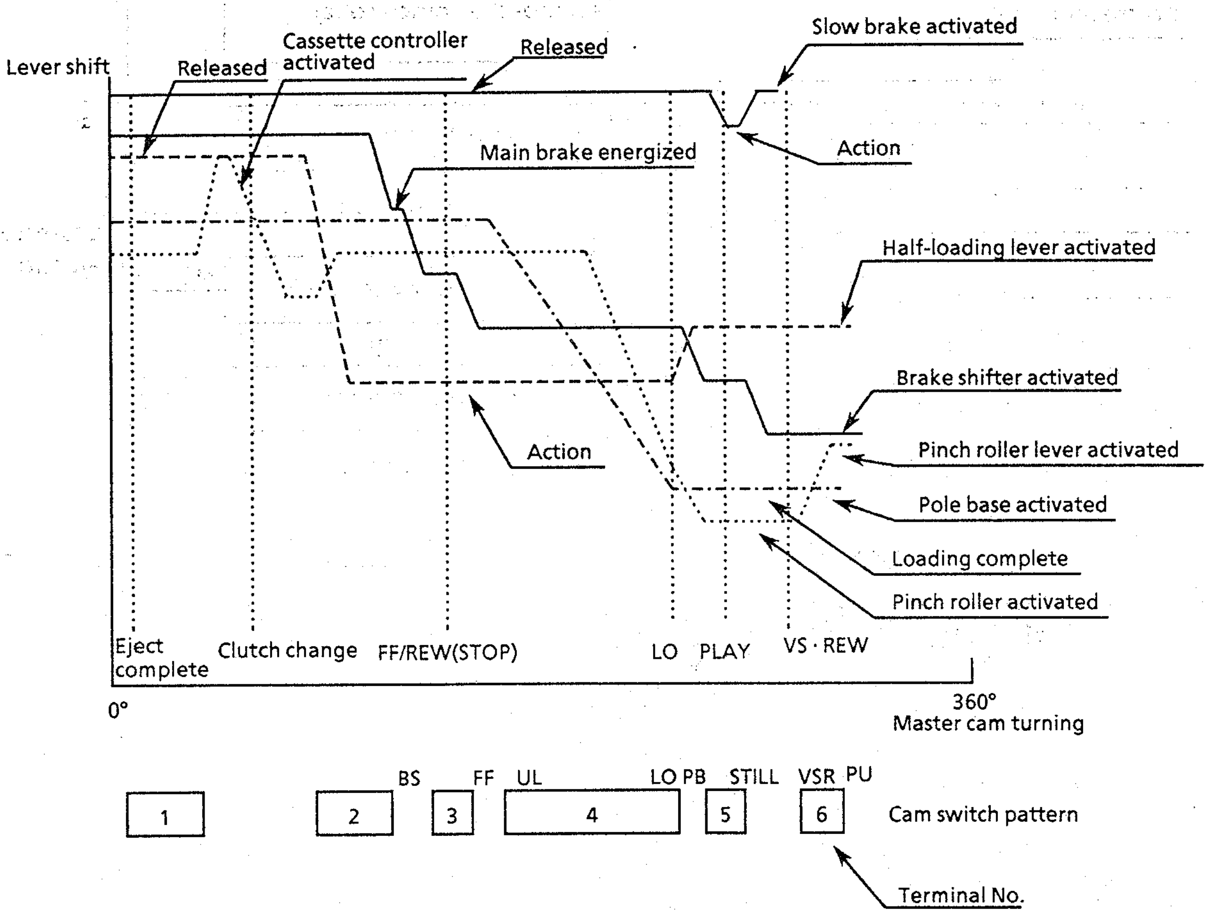
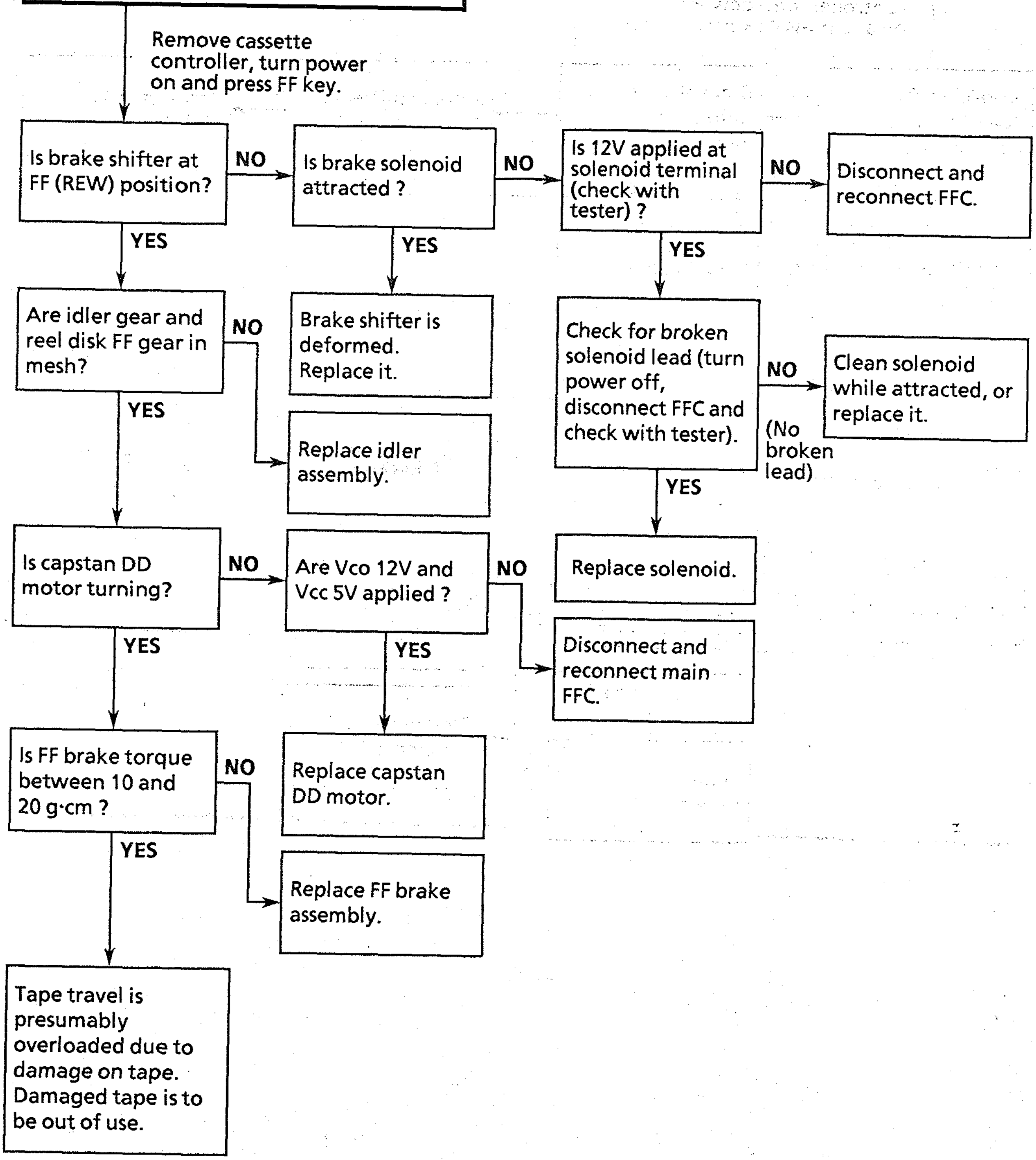

Lever shift
Released
Cassette controller activated
Released
Slow brake activated
Main brake energized
Action
Half-loading lever activated
Brake shifter activated
Action
Pinch roller lever activated
Pole base activated
Loading complete
Pinch roller activated
Eject complete
Clutch change
FF/REW(STOP)
LO
PLAY
VS · REW
0°
360°
Master cam turning
BS
FF
UL
LO
PB
STILL
VSR
PU
1
2
3
4
5
6
Cam switch pattern
Terminal No.

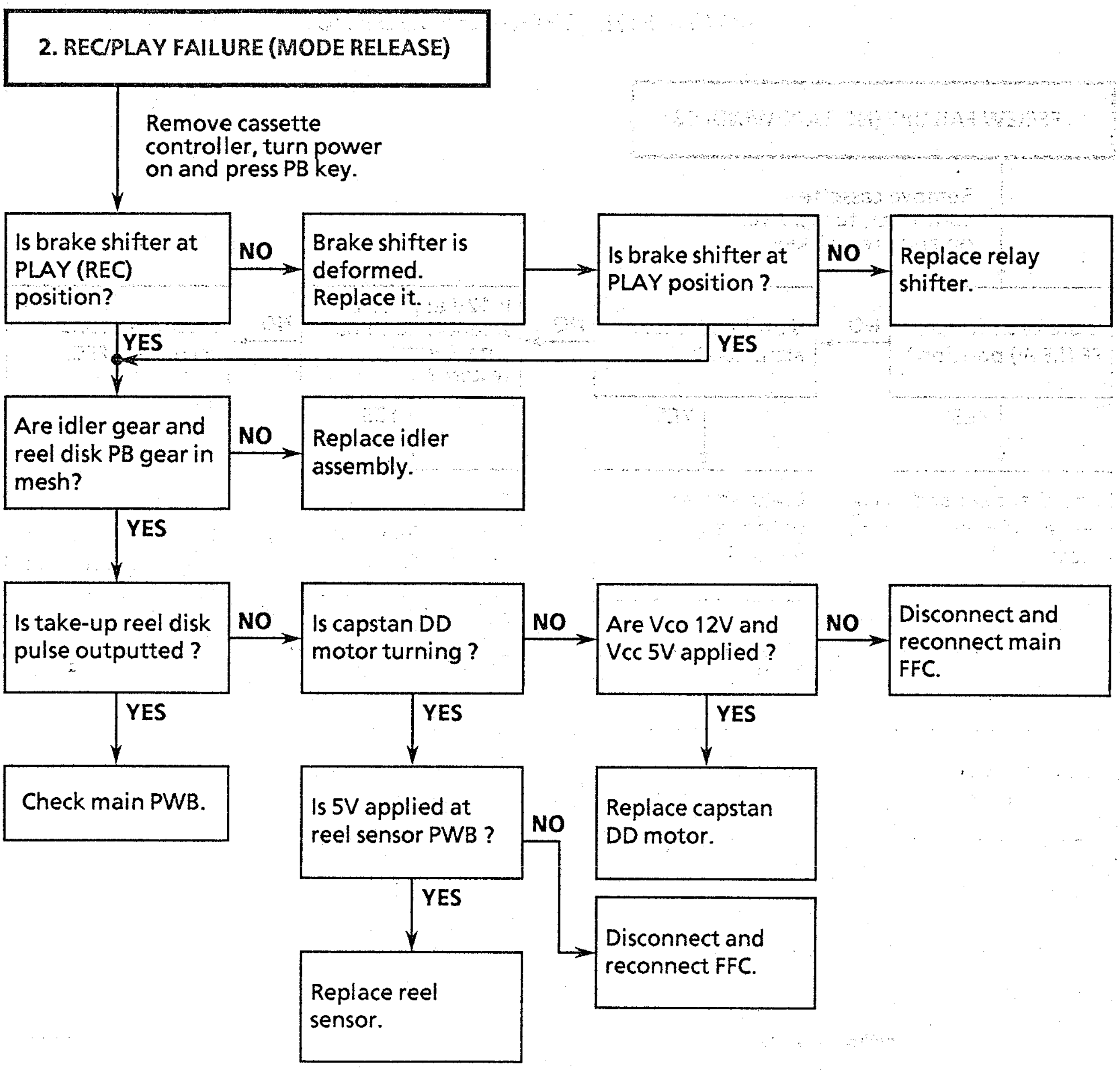
Fig. 3-2 Relationship between cam switch positions and mechanism movement

The relationship between the cam switch positions and the mechanism movement is shown in Fig. 3-2.

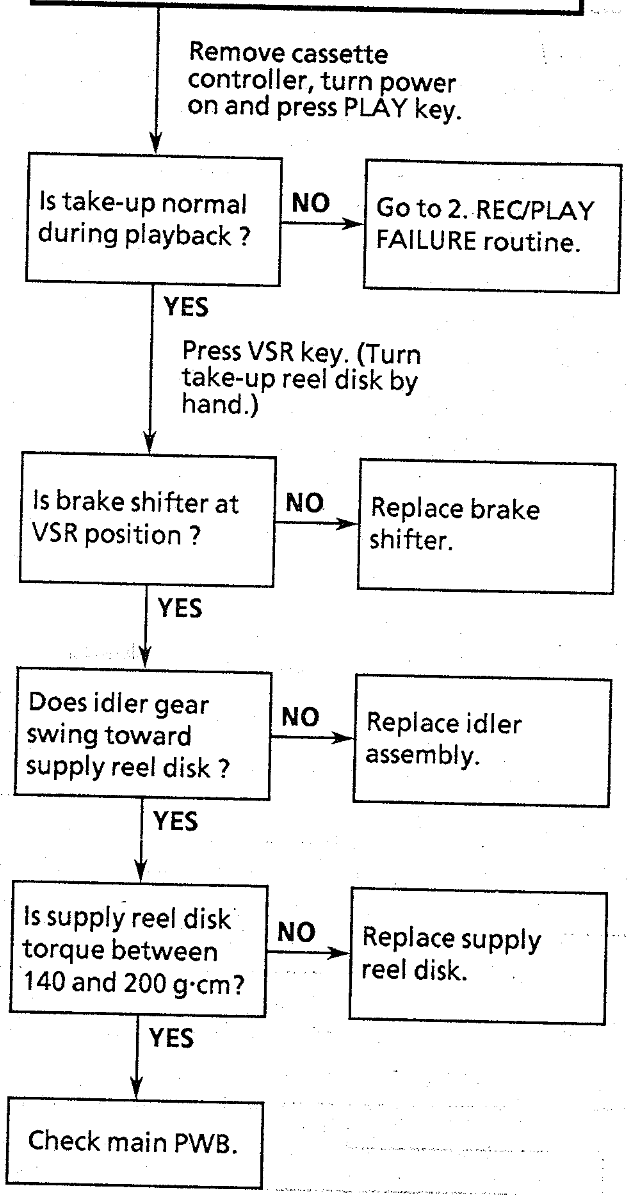
MECHANISM TROUBLESHOOTING

1. FF/REW FAILURE (NO TAPE WINDING)

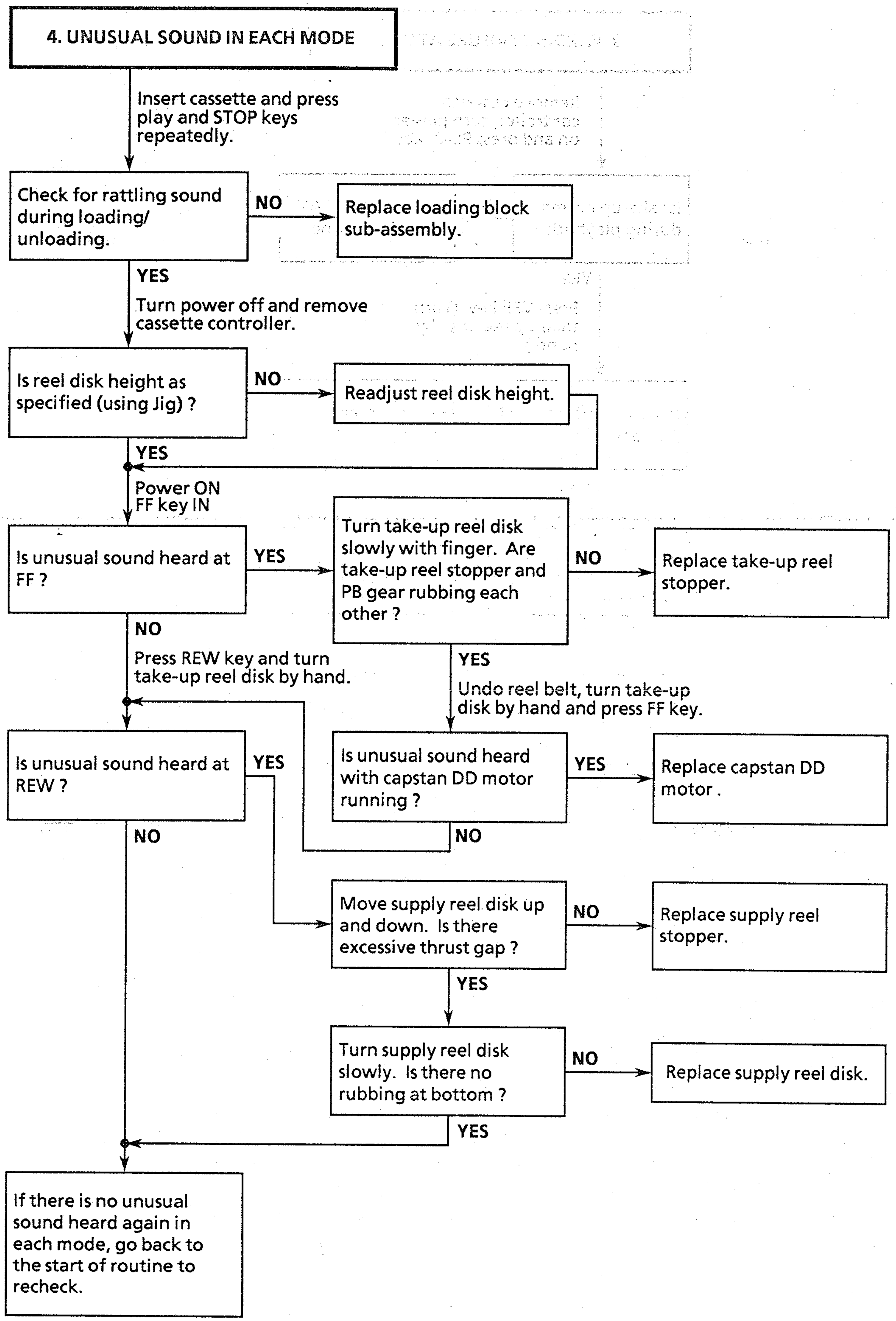

Remove cassette controller, turn power on and press FF key.
Is brake shifter at FF (REW) position?
NO
Is brake solenoid attracted ?
NO
Is 12V applied at solenoid terminal (check with tester) ?
NO
Disconnect and reconnect FFC.
YES
Are idler gear and reel disk FF gear in mesh?
NO
YES
Brake shifter is deformed. Replace it.
YES
Check for broken solenoid lead (turn power off, disconnect FFC and check with tester).
NO
Clean solenoid while attracted, or replace it.
(No broken lead)
YES
Replace idler assembly.
YES
Is capstan DD motor turning?
NO
Are Vco 12V and Vcc 5V applied ?
NO
Replace solenoid.
YES
YES
Disconnect and reconnect main FFC.
Is FF brake torque between 10 and 20 g·cm ?
NO
Replace capstan DD motor.
YES
Replace FF brake assembly.
Tape travel is presumably overloaded due to damage on tape. Damaged tape is to be out of use.


2. REC/PLAY FAILURE (MODE RELEASE)
Remove cassette controller, turn power on and press PB key.
Is brake shifter at PLAY (REC) position?
NO
Brake shifter is deformed. Replace it.
Is brake shifter at PLAY position ?
NO
Replace relay shifter.
YES
YES
Are idler gear and reel disk PB gear in mesh?
NO
Replace idler assembly.
YES
Is take-up reel disk pulse outputted ?
NO
Is capstan DD motor turning ?
NO
Are Vco 12V and Vcc 5V applied ?
NO
Disconnect and reconnect main FFC.
YES
YES
YES
Check main PWB.
Is 5V applied at reel sensor PWB ?
NO
Replace capstan DD motor.
YES
Disconnect and reconnect FFC.
Replace reel sensor.

3. WINDING FAILURE AT VSR

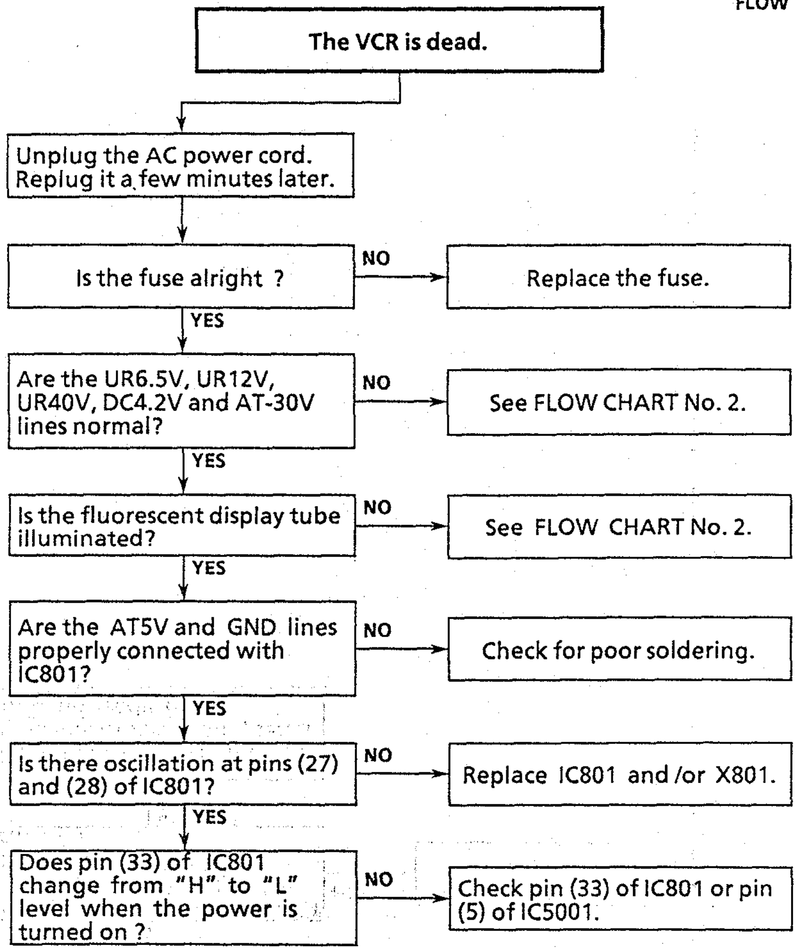

Remove cassette controller, turn power on and press PLAY key.
Is take-up normal during playback ?
NO
Go to 2. REC/PLAY FAILURE routine.
YES
Press VSR key. (Turn take-up reel disk by hand.)
Is brake shifter at VSR position ?
NO
Replace brake shifter.
YES
Does idler gear swing toward supply reel disk ?
NO
Replace idler assembly.
YES
Is supply reel disk torque between 140 and 200 g·cm?
NO
Replace supply reel disk.
YES
Check main PWB.

4. UNUSUAL SOUND IN EACH MODE


Insert cassette and press play and STOP keys repeatedly.
Check for rattling sound during loading/ unloading.
NO
Replace loading block sub-assembly.
YES
Turn power off and remove cassette controller.
Is reel disk height as specified (using Jig) ?
NO
Readjust reel disk height.
YES
Power ON
FF key IN
Is unusual sound heard at FF ?
YES
Turn take-up reel disk slowly with finger. Are take-up reel stopper and PB gear rubbing each other ?
NO
Replace take-up reel stopper.
NO
Press REW key and turn take-up reel disk by hand.
YES
Undo reel belt, turn take-up disk by hand and press FF key.
Is unusual sound heard at REW ?
YES
Is unusual sound heard with capstan DD motor running ?
YES
Replace capstan DD motor .
NO
NO
Move supply reel disk up and down. Is there excessive thrust gap ?
NO
Replace supply reel stopper.
YES
Turn supply reel disk slowly. Is there no rubbing at bottom ?
NO
Replace supply reel disk.
YES
If there is no unusual sound heard again in each mode, go back to the start of routine to recheck.

POWER TROUBLESHOOTING

FLOW CHART NO. 1



The VCR is dead.

Unplug the AC power cord. Replug it a few minutes later.

Is the fuse alright ? NO → Replace the fuse.

YES

Are the UR6.5V, UR12V, UR40V, DC4.2V and AT-30V lines normal? NO → See FLOW CHART No. 2.

YES

Is the fluorescent display tube illuminated? NO → See FLOW CHART No. 2.

YES

Are the AT5V and GND lines properly connected with IC801? NO → Check for poor soldering.

YES

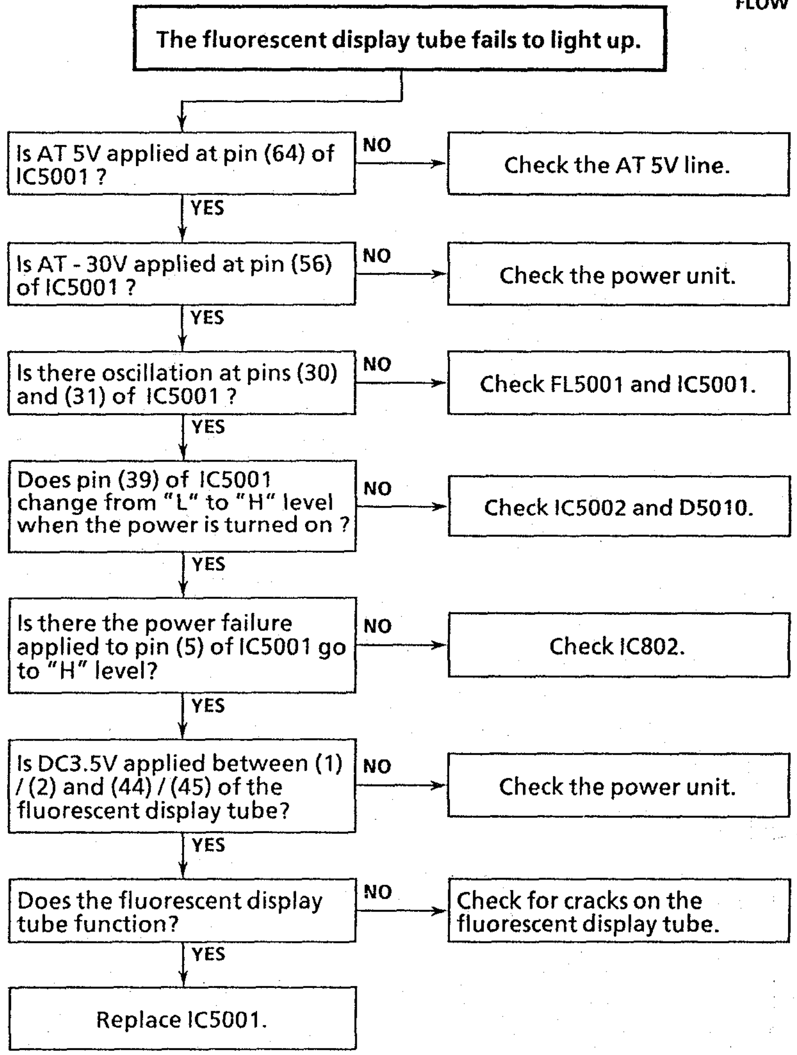
Is there oscillation at pins (27) and (28) of IC801? NO → Replace IC801 and /or X801.

YES

Does pin (33) of IC801 change from "H" to "L" level when the power is turned on ? NO → Check pin (33) of IC801 or pin (5) of IC5001.

TIMER (1) TROUBLESHOOTING

FLOW CHART NO. 2



The fluorescent display tube fails to light up.

Is AT 5V applied at pin (64) of IC5001 ? NO → Check the AT 5V line.

YES

Is AT - 30V applied at pin (56) of IC5001 ? NO → Check the power unit.

YES

Is there oscillation at pins (30) and (31) of IC5001 ? NO → Check FL5001 and IC5001.

YES

Does pin (39) of IC5001 change from "L" to "H" level when the power is turned on ? NO → Check IC5002 and D5010.

YES

Is there the power failure applied to pin (5) of IC5001 go to "H" level? NO → Check IC802.

YES

Is DC3.5V applied between (1) / (2) and (44) / (45) of the fluorescent display tube? NO → Check the power unit.

YES

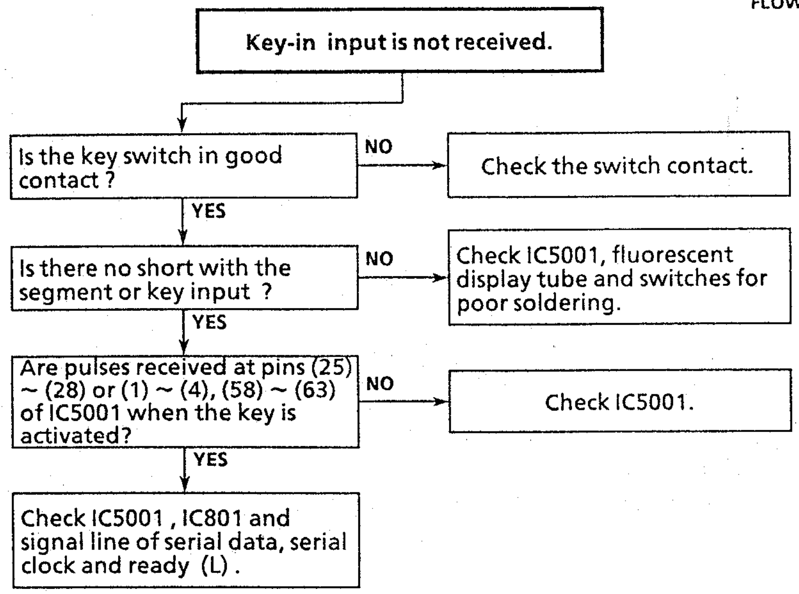
Does the fluorescent display tube function? NO → Check for cracks on the fluorescent display tube.

YES

Replace IC5001.

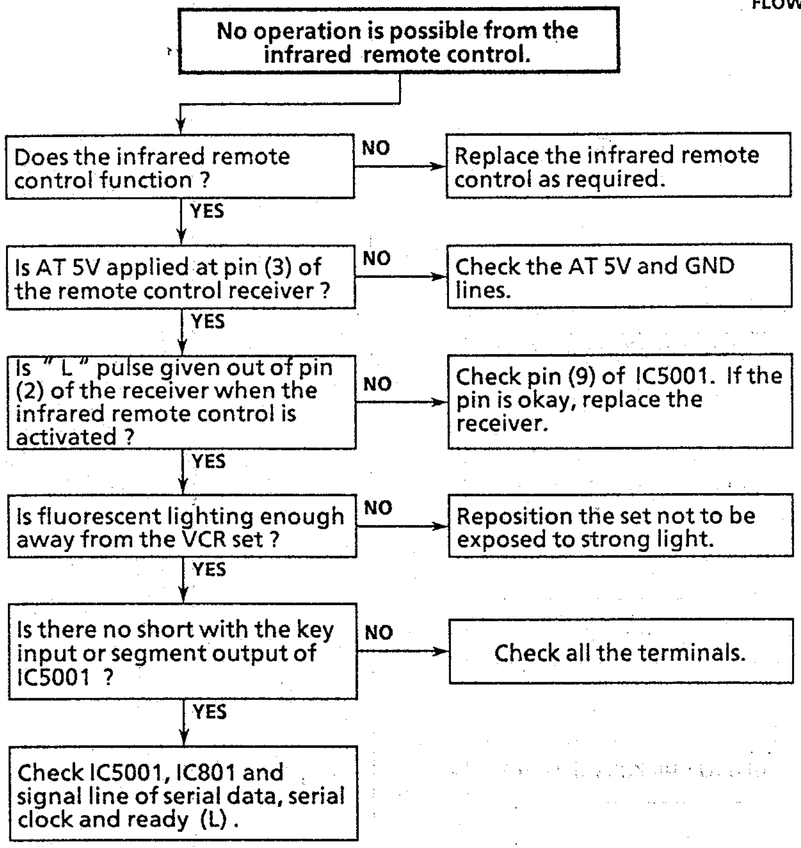
TIMER (2) TROUBLESHOOTING

FLOW CHART NO. 3


Key-in input is not received.
Is the key switch in good contact ?
NO
Check the switch contact.
YES
Is there no short with the segment or key input ?
NO
Check IC5001, fluorescent display tube and switches for poor soldering.
YES
Are pulses received at pins (25) ~ (28) or (1) ~ (4), (58) ~ (63) of IC5001 when the key is activated?
NO
Check IC5001.
YES
Check IC5001 , IC801 and signal line of serial data, serial clock and ready (L) .

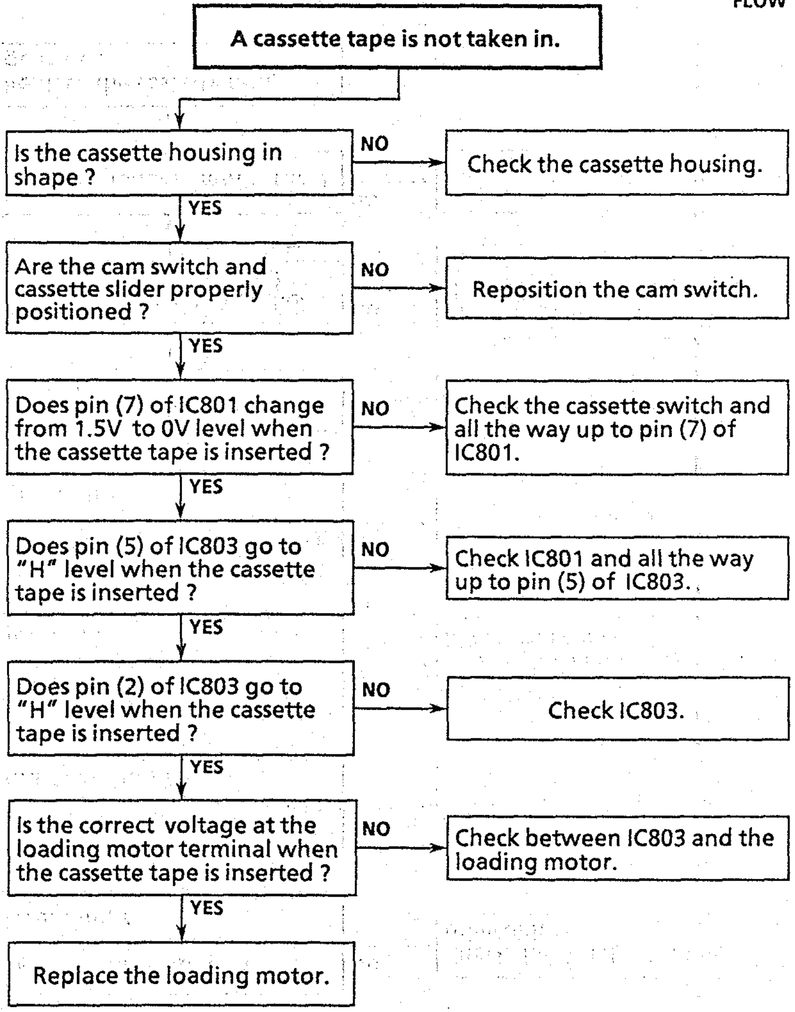
INFRARED R/C TROUBLESHOOTING

FLOW CHART NO. 4


No operation is possible from the infrared remote control.
Does the infrared remote control function ?
NO
Replace the infrared remote control as required.
YES
Is AT 5V applied at pin (3) of the remote control receiver ?
NO
Check the AT 5V and GND lines.
YES
Is " L " pulse given out of pin (2) of the receiver when the infrared remote control is activated ?
NO
Check pin (9) of IC5001. If the pin is okay, replace the receiver.
YES
Is fluorescent lighting enough away from the VCR set ?
NO
Reposition the set not to be exposed to strong light.
YES
Is there no short with the key input or segment output of IC5001 ?
NO
Check all the terminals.
YES
Check IC5001, IC801 and signal line of serial data, serial clock and ready (L) .

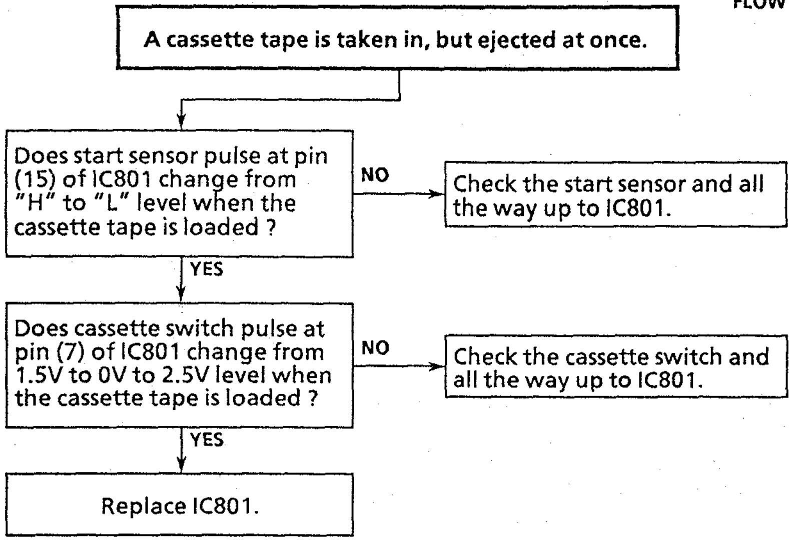
CASSETTE CONTROL TROUBLESHOOTING

FLOW CHART NO. 5


A cassette tape is not taken in.
Is the cassette housing in shape ?
NO
Check the cassette housing.
YES
Are the cam switch and cassette slider properly positioned ?
NO
Reposition the cam switch.
YES
Does pin (7) of IC801 change from 1.5V to 0V level when the cassette tape is inserted ?
NO
Check the cassette switch and all the way up to pin (7) of IC801.
YES
Does pin (5) of IC803 go to "H" level when the cassette tape is inserted ?
NO
Check IC801 and all the way up to pin (5) of IC803.
YES
Does pin (2) of IC803 go to "H" level when the cassette tape is inserted ?
NO
Check IC803.
YES
Is the correct voltage at the loading motor terminal when the cassette tape is inserted ?
NO
Check between IC803 and the loading motor.
YES
Replace the loading motor.

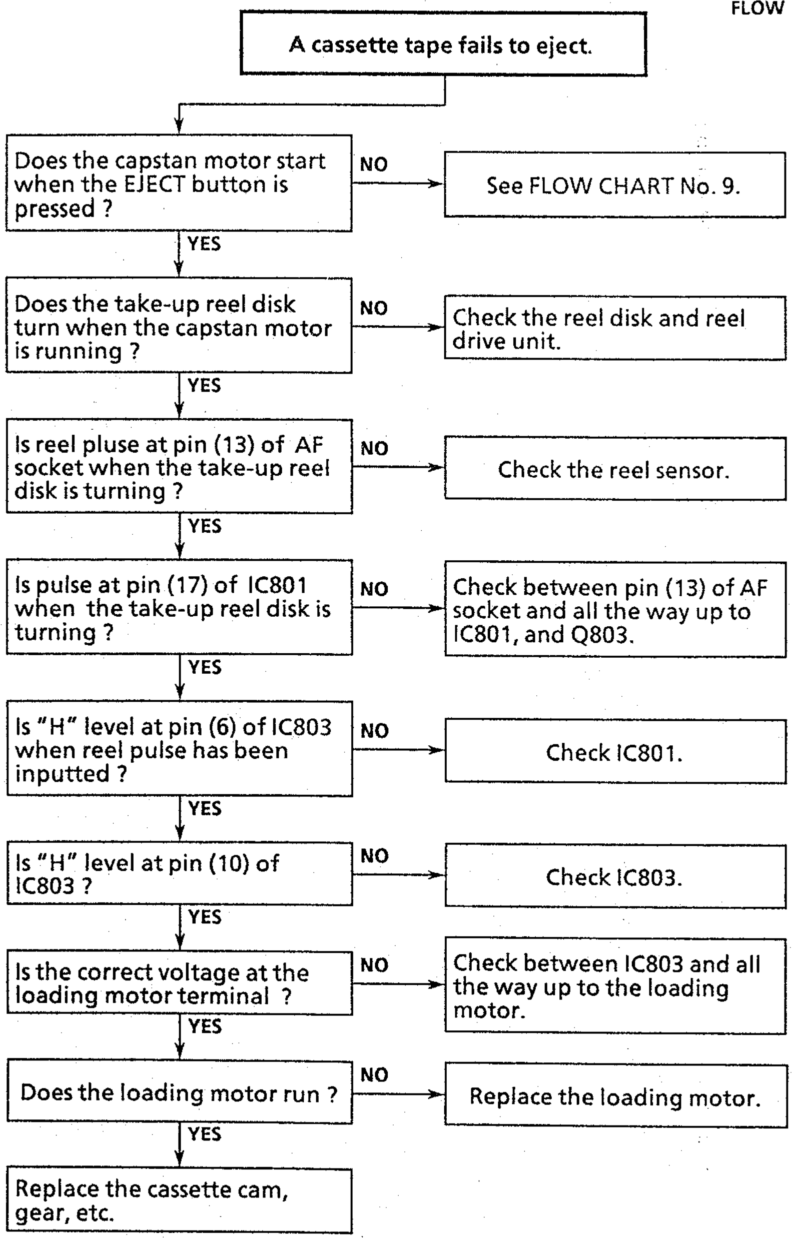
CASSETTE CONTROL TROUBLESHOOTING

FLOW CHART NO. 6


A cassette tape is taken in, but ejected at once.
Does start sensor pulse at pin (15) of IC801 change from "H" to "L" level when the cassette tape is loaded ?
NO
Check the start sensor and all the way up to IC801.
YES
Does cassette switch pulse at pin (7) of IC801 change from 1.5V to 0V to 2.5V level when the cassette tape is loaded ?
NO
Check the cassette switch and all the way up to IC801.
YES
Replace IC801.

LOADING MOTOR AND EJECT TROUBLESHOOTING

FLOW CHART NO. 7


A cassette tape fails to eject.

Does the capstan motor start when the EJECT button is pressed ?
See FLOW CHART No. 9.

Does the take-up reel disk turn when the capstan motor is running ?
Check the reel disk and reel drive unit.

Is reel pluse at pin (13) of AF socket when the take-up reel disk is turning ?
Check the reel sensor.

Is pulse at pin (17) of IC801 when the take-up reel disk is turning ?
Check between pin (13) of AF socket and all the way up to IC801, and Q803.

Is "H" level at pin (6) of IC803 when reel pulse has been inputted ?
Check IC801.

Is "H" level at pin (10) of IC803 ?
Check IC803.

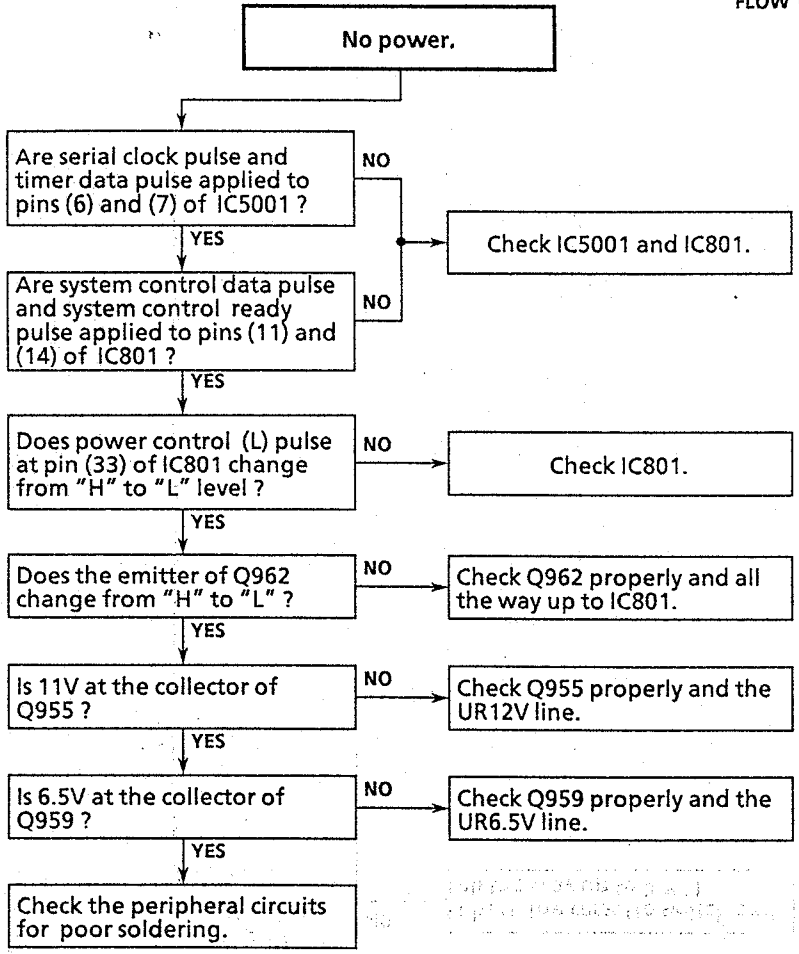
Is the correct voltage at the loading motor terminal ?
Check between IC803 and all the way up to the loading motor.

Does the loading motor run ?
Replace the loading motor.

Replace the cassette cam, gear, etc.

SYSTEM CONTROL TROUBLESHOOTING

FLOW CHART NO. 8


No power.

Are serial clock pulse and timer data pulse applied to pins (6) and (7) of IC5001 ?
Are system control data pulse and system control ready pulse applied to pins (11) and (14) of IC801 ?
Check IC5001 and IC801.

Does power control (L) pulse at pin (33) of IC801 change from "H" to "L" level ?
Check IC801.

Does the emitter of Q962 change from "H" to "L" ?
Check Q962 properly and all the way up to IC801.

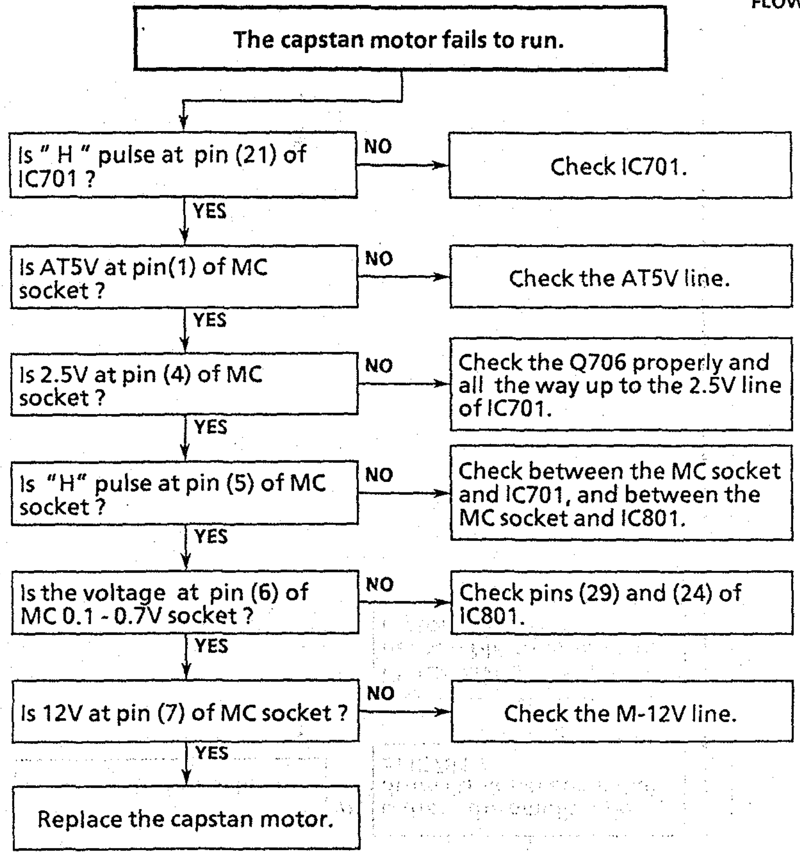
Is 11V at the collector of Q955 ?
Check Q955 properly and the UR12V line.

Is 6.5V at the collector of Q959 ?
Check Q959 properly and the UR6.5V line.

Check the peripheral circuits for poor soldering.

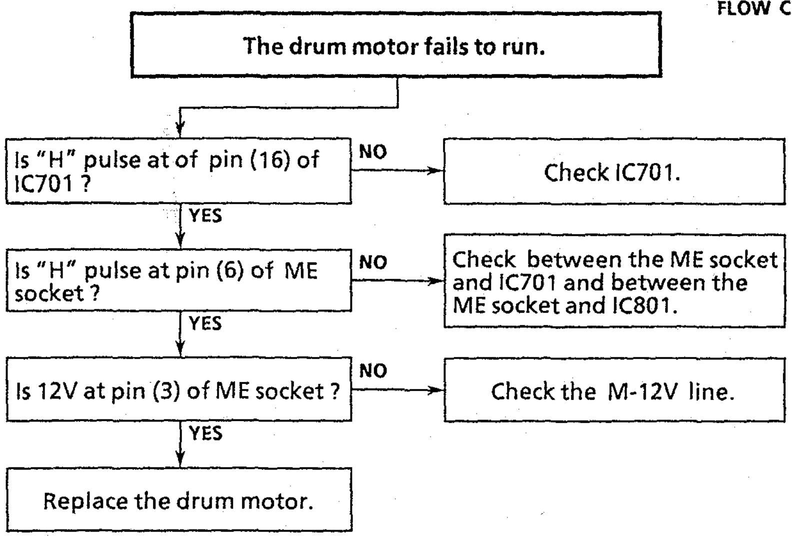
CAPSTAN MOTOR TROUBLESHOOTING

FLOW CHART NO. 9

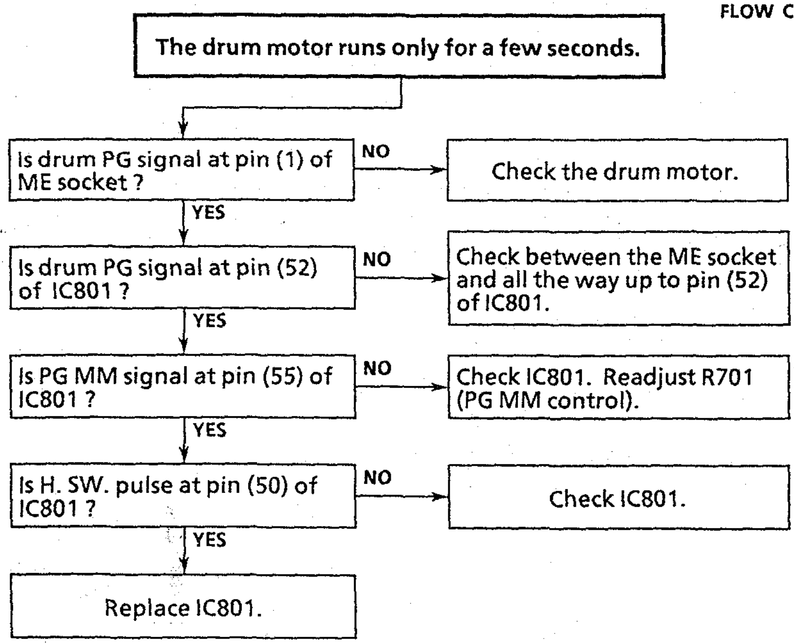

The capstan motor fails to run.
Is " H " pulse at pin (21) of IC701 ?
NO
Check IC701.
YES
Is AT5V at pin(1) of MC socket ?
NO
Check the AT5V line.
YES
Is 2.5V at pin (4) of MC socket ?
NO
Check the Q706 properly and all the way up to the 2.5V line of IC701.
YES
Is "H" pulse at pin (5) of MC socket ?
NO
Check between the MC socket and IC701, and between the MC socket and IC801.
YES
Is the voltage at pin (6) of MC 0.1 - 0.7V socket ?
NO
Check pins (29) and (24) of IC801.
YES
Is 12V at pin (7) of MC socket ?
NO
Check the M-12V line.
YES
Replace the capstan motor.

DRUM MOTOR TROUBLESHOOTING

FLOW CHART NO. 10

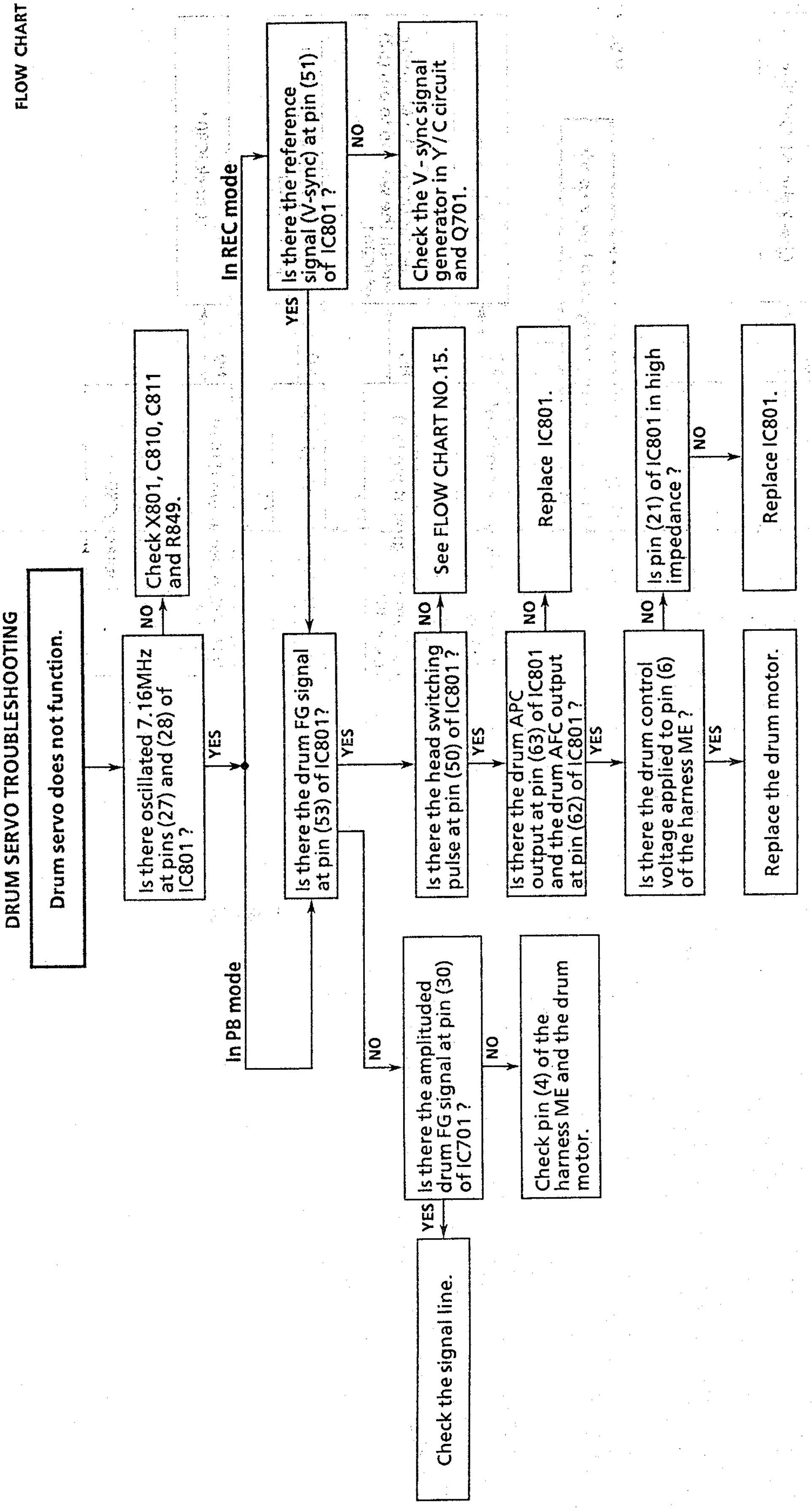

The drum motor fails to run.
Is "H" pulse at of pin (16) of IC701 ?
NO
Check IC701.
YES
Is "H" pulse at pin (6) of ME socket ?
NO
Check between the ME socket and IC701 and between the ME socket and IC801.
YES
Is 12V at pin (3) of ME socket ?
NO
Check the M-12V line.
YES
Replace the drum motor.

FLOW CHART NO. 11


The drum motor runs only for a few seconds.
Is drum PG signal at pin (1) of ME socket ?
NO
Check the drum motor.
YES
Is drum PG signal at pin (52) of IC801 ?
NO
Check between the ME socket and all the way up to pin (52) of IC801.
YES
Is PG MM signal at pin (55) of IC801 ?
NO
Check IC801. Readjust R701 (PG MM control).
YES
Is H. SW. pulse at pin (50) of IC801 ?
NO
Check IC801.
YES
Replace IC801.

FLOW CHART NO.12

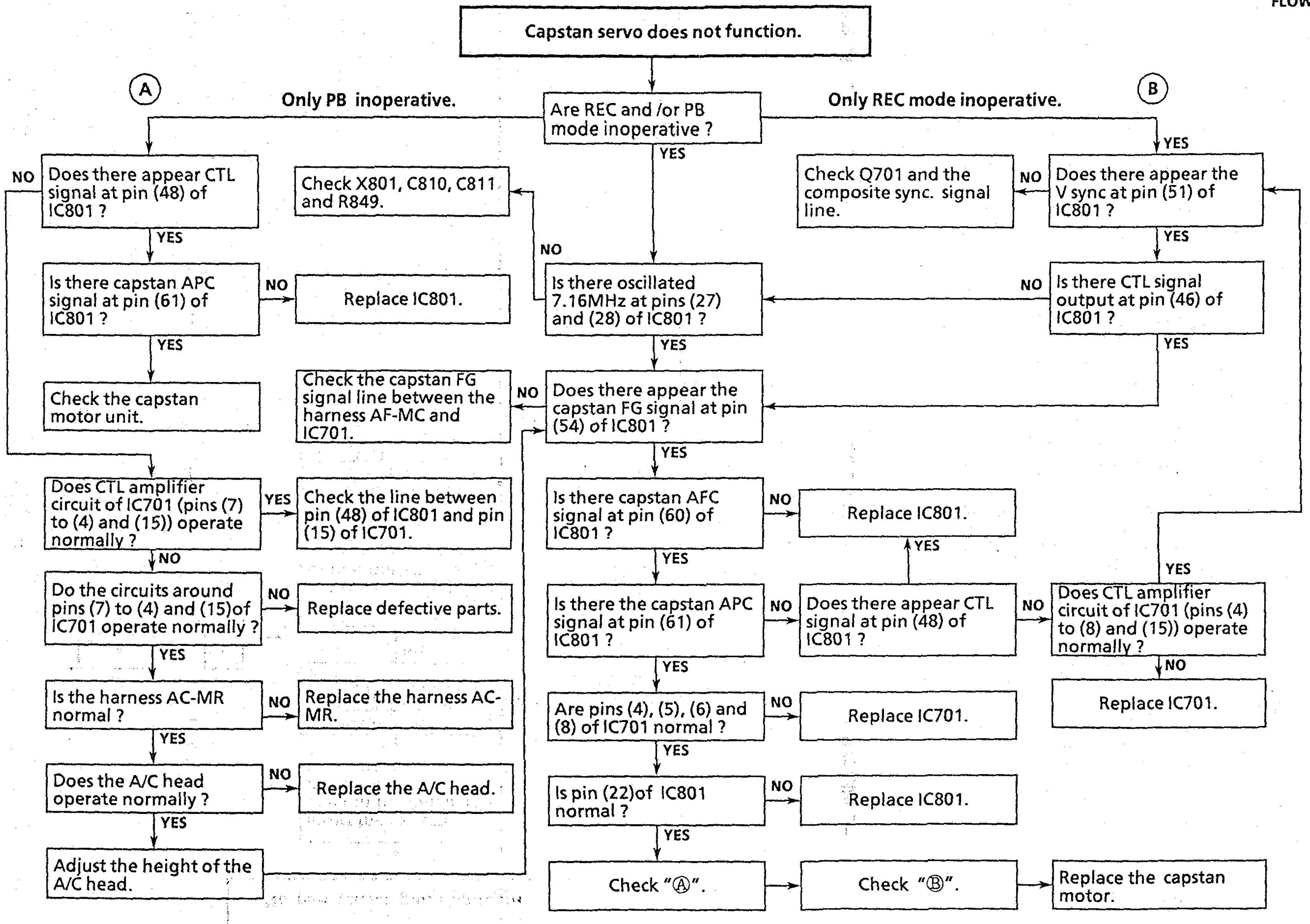
DRUM SERVO TROUBLESHOOTING


Drum servo does not function.
Is there oscillated 7.16MHz at pins (27) and (28) of IC801 ?
NO
Check X801, C810, C811 and R849.
YES
In REC mode
In PB mode
Is there the reference signal (V-sync) at pin (51) of IC801 ?
NO
Check the V - sync signal generator in Y/C circuit and Q701.
YES
Is there the drum FG signal at pin (53) of IC801?
YES
NO
Is there the head switching pulse at pin (50) of IC801 ?
NO
See FLOW CHART NO.15.
YES
Is there the drum APC output at pin (63) of IC801 and the drum AFC output at pin (62) of IC801 ?
NO
Replace IC801.
YES
Is there the drum control voltage applied to pin (6) of the harness ME ?
NO
Is pin (21) of IC801 in high impedance ?
NO
Replace IC801.
YES
Replace the drum motor.
Is there the amplituded drum FG signal at pin (30) of IC701 ?
NO
Check pin (4) of the harness ME and the drum motor.
YES
Check the signal line.

]

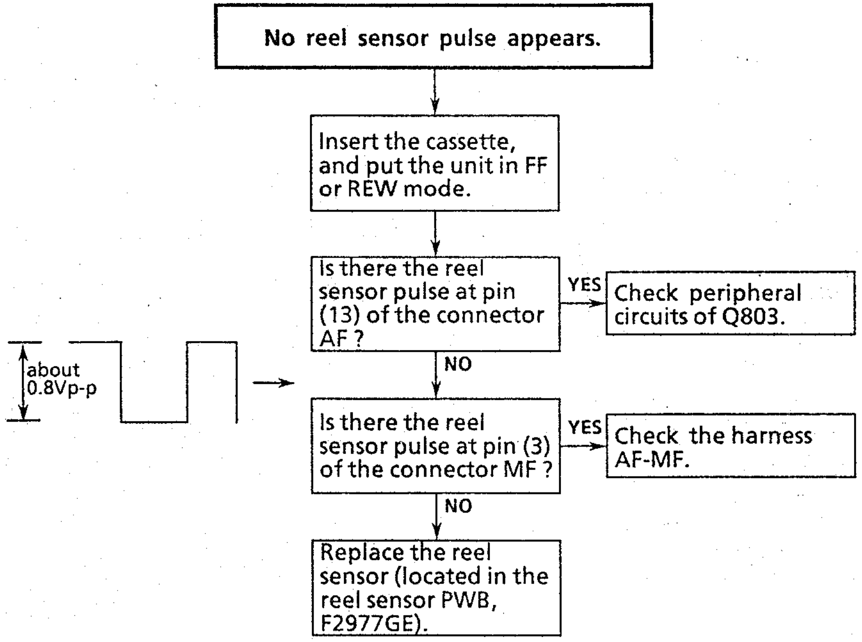
FLOW CHART NO. 13

CAPSTAN SERVO TROUBLESHOOTING


Capstan servo does not function.
Are REC and /or PB mode inoperative ?
Only PB inoperative.
Only REC mode inoperative.
Ⓐ
Ⓑ
YES
NO
Does there appear CTL signal at pin (48) of IC801 ?
Is there capstan APC signal at pin (61) of IC801 ?
Replace IC801.
Check the capstan motor unit.
Does CTL amplifier circuit of IC701 (pins (7) to (4) and (15)) operate normally ?
Check the line between pin (48) of IC801 and pin (15) of IC701.
Do the circuits around pins (7) to (4) and (15)of IC701 operate normally ?
Replace defective parts.
Is the harness AC-MR normal ?
Replace the harness AC-MR.
Does the A/C head operate normally ?
Replace the A/C head.
Adjust the height of the A/C head.
Check X801, C810, C811 and R849.
Is there oscillated 7.16MHz at pins (27) and (28) of IC801 ?
Check the capstan FG signal line between the harness AF-MC and IC701.
Does there appear the capstan FG signal at pin (54) of IC801 ?
Is there capstan AFC signal at pin (60) of IC801 ?
Replace IC801.
Is there the capstan APC signal at pin (61) of IC801 ?
Does there appear CTL signal at pin (48) of IC801 ?
Are pins (4), (5), (6) and (8) of IC701 normal ?
Replace IC701.
Is pin (22)of IC801 normal ?
Replace IC801.
Check "Ⓐ".
Check "Ⓑ".
Replace the capstan motor.
Check Q701 and the composite sync. signal line.
Does there appear the V sync at pin (51) of IC801 ?
Is there CTL signal output at pin (46) of IC801 ?
Does CTL amplifier circuit of IC701 (pins (4) to (8) and (15)) operate normally ?
Replace IC701.

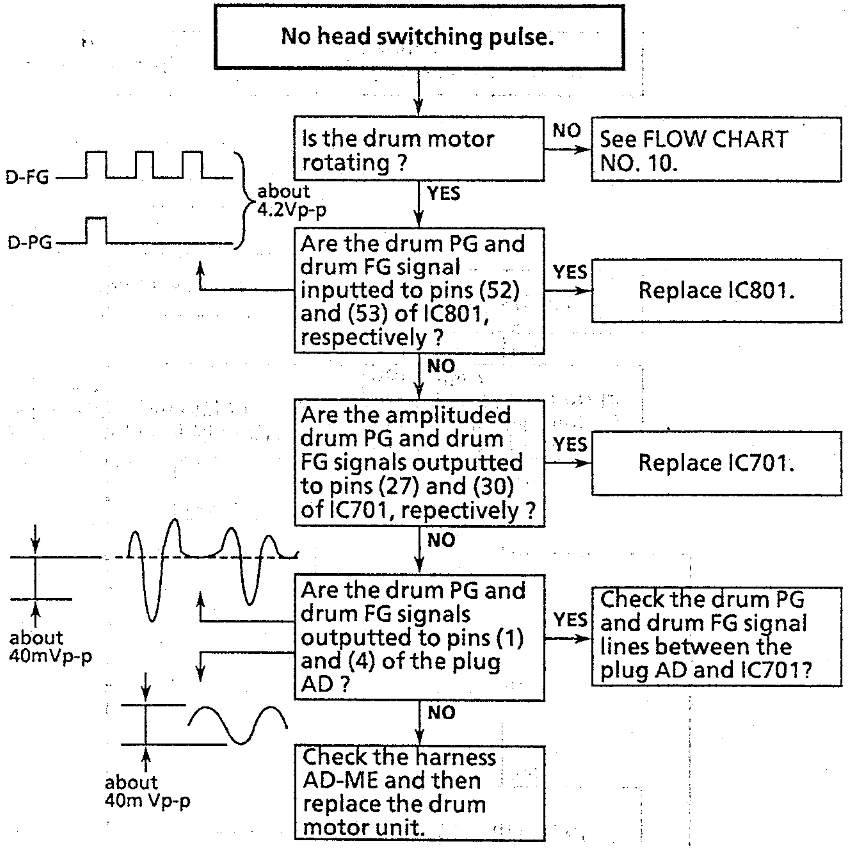
FLOW CHART NO. 14

TAKE-UP REEL PULSE GENERATOR TROUBLESHOOTING


No reel sensor pulse appears.
Insert the cassette, and put the unit in FF or REW mode.
Is there the reel sensor pulse at pin (13) of the connector AF ?
YES
Check peripheral circuits of Q803.
NO
Is there the reel sensor pulse at pin (3) of the connector MF ?
YES
Check the harness AF-MF.
NO
Replace the reel sensor (located in the reel sensor PWB, F2977GE).
about 0.8Vp-p

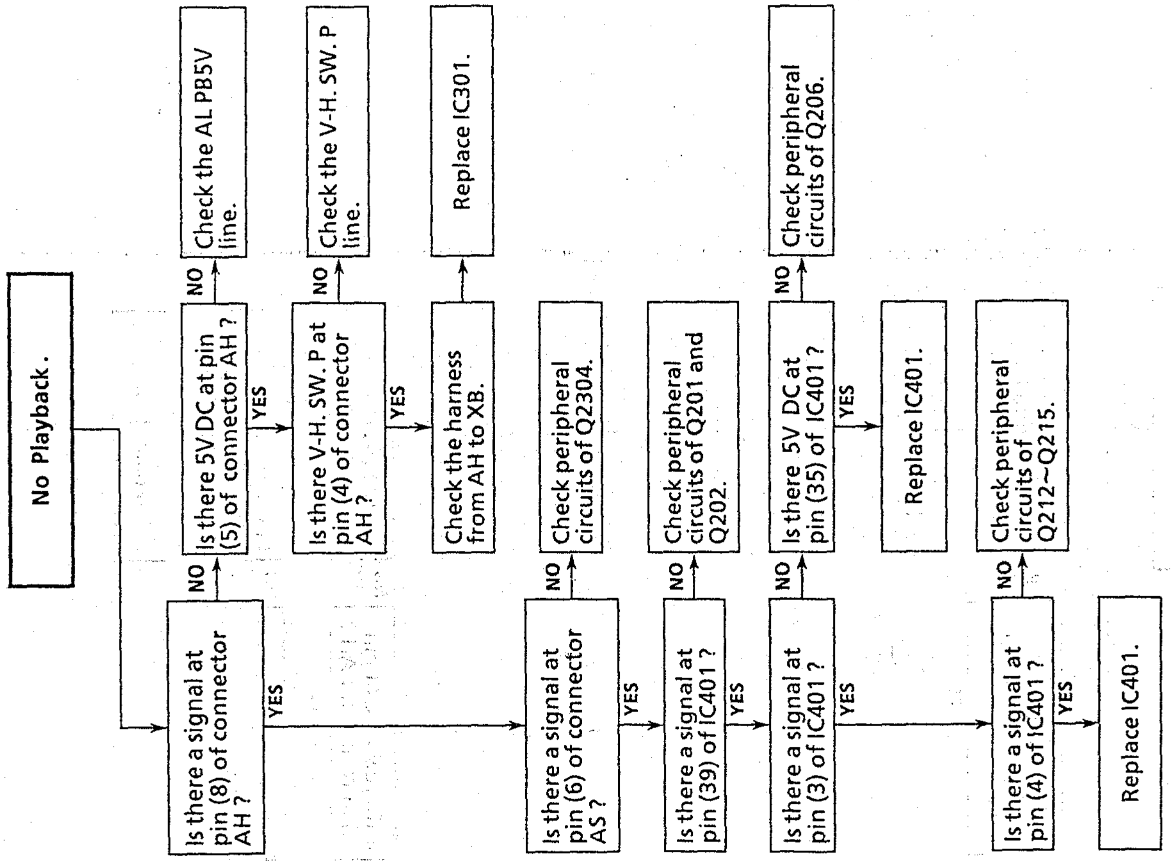
FLOW CHART NO. 15

HEAD SWITCHING PULSE TROUBLESHOOTING


No head switching pulse.
Is the drum motor rotating ?
NO
See FLOW CHART NO. 10.
YES
Are the drum PG and drum FG signal inputted to pins (52) and (53) of IC801, respectively ?
YES
Replace IC801.
NO
Are the amplituded drum PG and drum FG signals outputted to pins (27) and (30) of IC701, repectively ?
YES
Replace IC701.
NO
Are the drum PG and drum FG signals outputted to pins (1) and (4) of the plug AD ?
YES
Check the drum PG and drum FG signal lines between the plug AD and IC701?
NO
Check the harness AD-ME and then replace the drum motor unit.
D-FG
D-PG
about 4.2Vp-p
about 40mVp-p
about 40m Vp-p

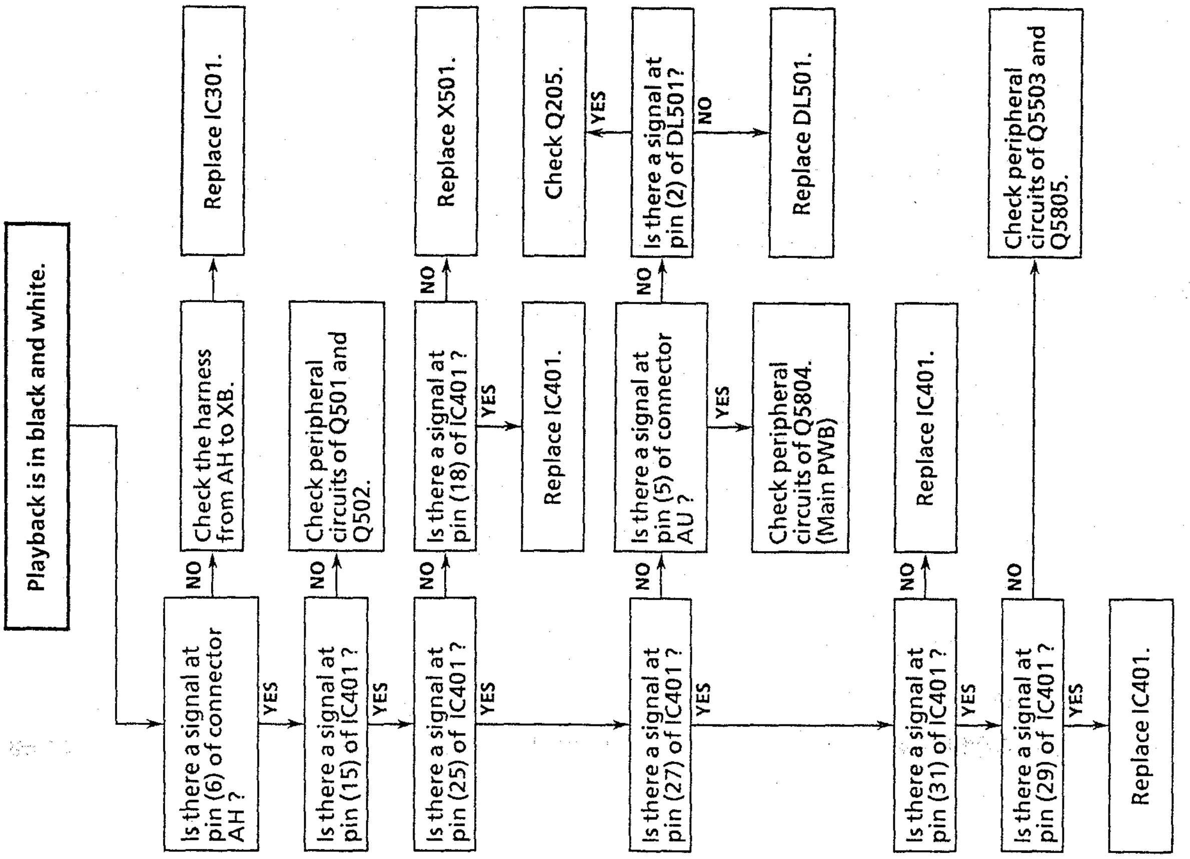
FLOW CHART NO.16

PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING


No Playback.
Is there a signal at pin (8) of connector AH ?
NO
Is there 5V DC at pin (5) of connector AH ?
NO
Check the AL PB5V line.
YES
Is there V-H. SW. P at pin (4) of connector AH ?
NO
Check the V-H. SW. P line.
YES
Check the harness from AH to XB.
Replace IC301.
YES
Is there a signal at pin (6) of connector AS ?
NO
Check peripheral circuits of Q2304.
YES
Is there a signal at pin (39) of IC401 ?
NO
Check peripheral circuits of Q201 and Q202.
YES
Is there a signal at pin (3) of IC401 ?
NO
Is there 5V DC at pin (35) of IC401 ?
NO
Check peripheral circuits of Q206.
YES
Replace IC401.
YES
Is there a signal at pin (4) of IC401 ?
NO
Check peripheral circuits of Q212~Q215.
YES
Replace IC401.

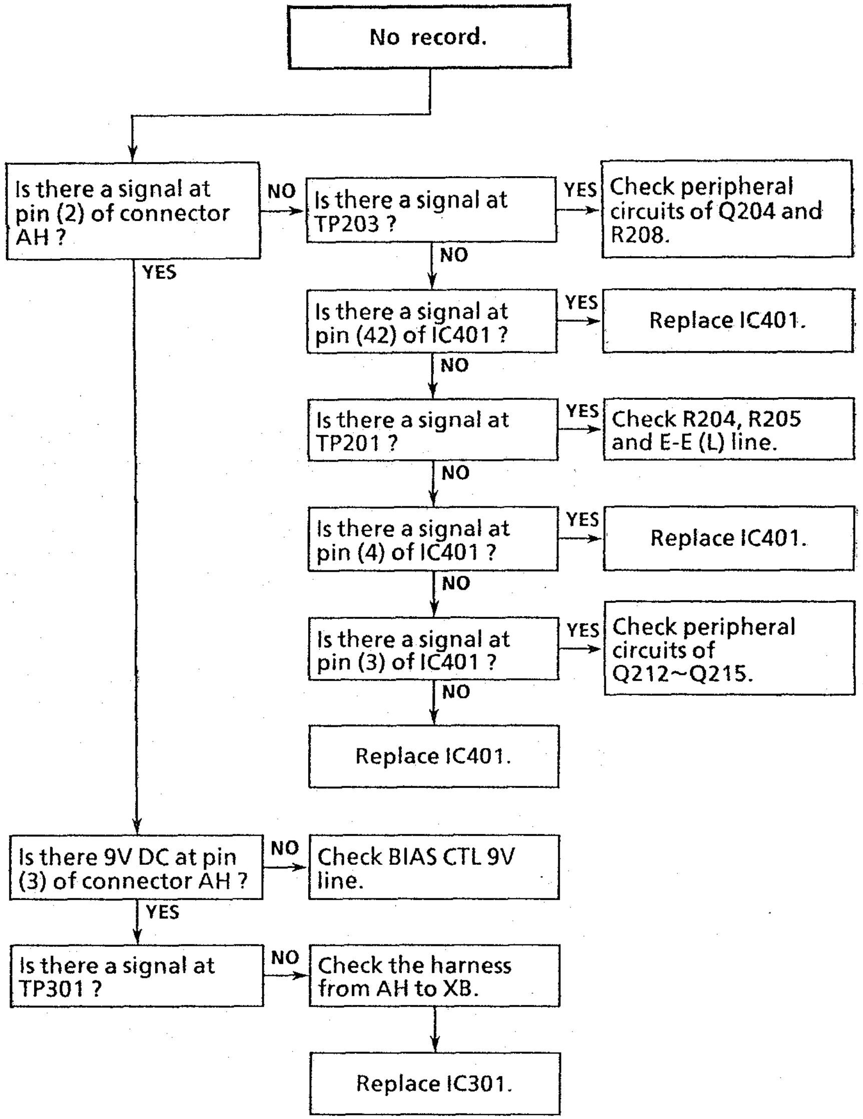
FLOW CHART NO.17

PLAYBACK MODE (CHROMINANCE) TROUBLESHOOTING


Playback is in black and white.
Is there a signal at pin (6) of connector AH ?
NO
Check the harness from AH to XB.
Replace IC301.
YES
Is there a signal at pin (15) of IC401 ?
NO
Check peripheral circuits of Q501 and Q502.
YES
Is there a signal at pin (25) of IC401 ?
NO
Is there a signal at pin (18) of IC401 ?
NO
Replace X501.
YES
Replace IC401.
YES
Is there a signal at pin (27) of IC401 ?
NO
Is there a signal at pin (5) of connector AU ?
NO
Is there a signal at pin (2) of DL501?
YES
Check Q205.
NO
Replace DL501.
YES
Check peripheral circuits of Q5804. (Main PWB)
YES
Is there a signal at pin (31) of IC401 ?
NO
Replace IC401.
YES
Is there a signal at pin (29) of IC401 ?
NO
Check peripheral circuits of Q5503 and Q5805.
YES
Replace IC401.

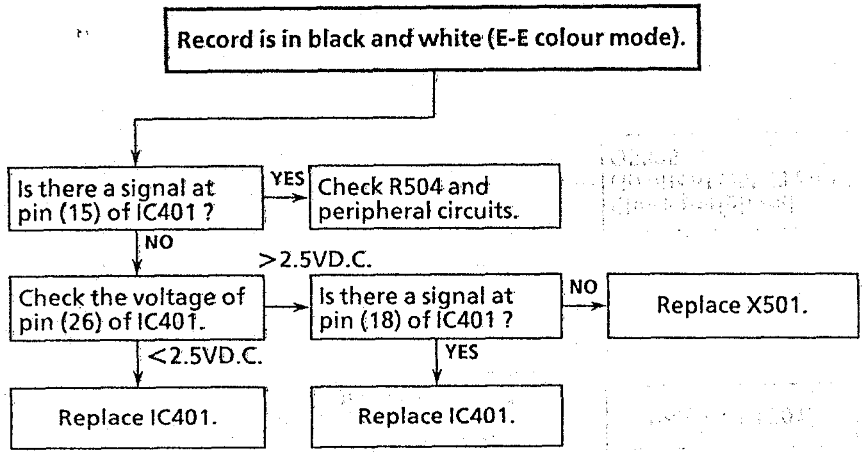
FLOW CHART NO. 18

RECORDING MODE (LUMINANCE) TROUBLESHOOTING


No record.
Is there a signal at pin (2) of connector AH ?
NO
Is there a signal at TP203 ?
YES
Check peripheral circuits of Q204 and R208.
NO
Is there a signal at pin (42) of IC401 ?
YES
Replace IC401.
NO
Is there a signal at TP201 ?
YES
Check R204, R205 and E-E (L) line.
NO
Is there a signal at pin (4) of IC401 ?
YES
Replace IC401.
NO
Is there a signal at pin (3) of IC401 ?
YES
Check peripheral circuits of Q212~Q215.
NO
Replace IC401.
YES
Is there 9V DC at pin (3) of connector AH ?
NO
Check BIAS CTL 9V line.
YES
Is there a signal at TP301 ?
NO
Check the harness from AH to XB.
Replace IC301.

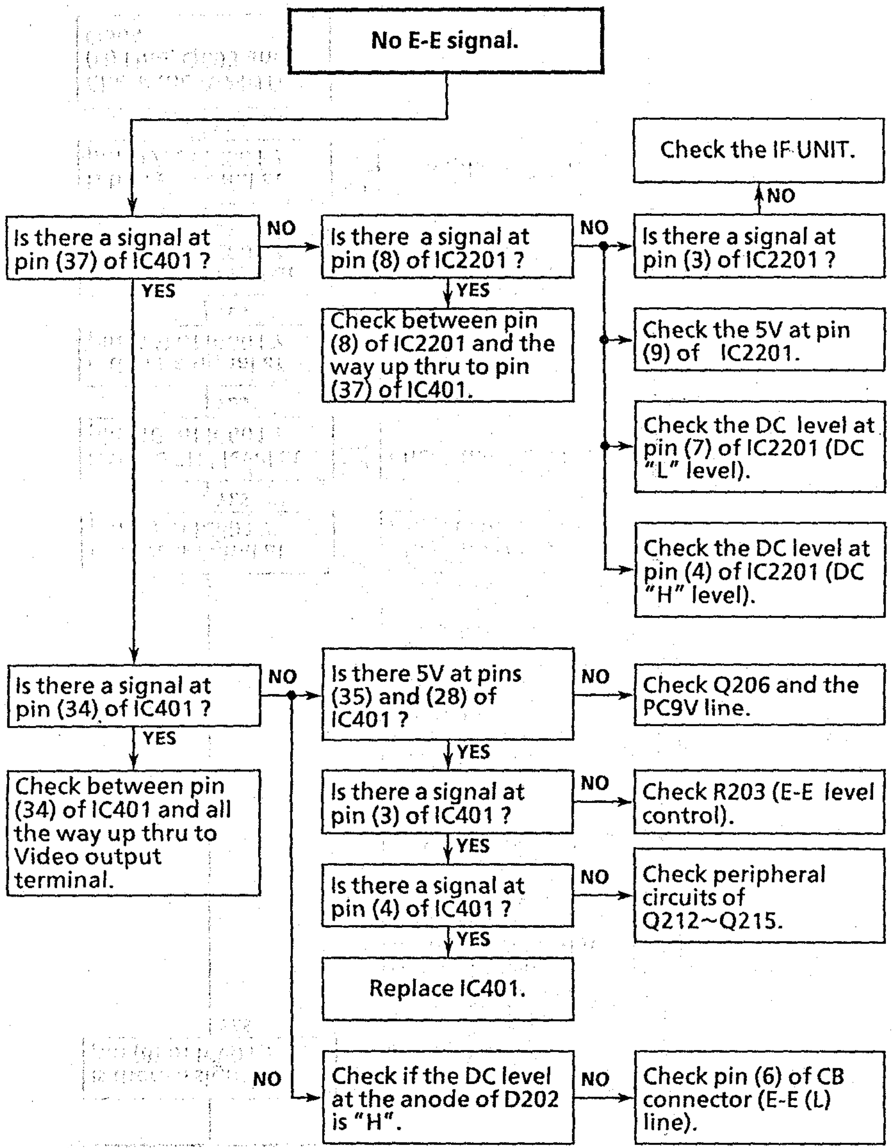
FLOW CHART NO. 19

RECORDING MODE (CHROMINANCE) TROUBLESHOOTING


Record is in black and white (E-E colour mode).
Is there a signal at pin (15) of IC401 ?
YES
Check R504 and peripheral circuits.
NO
Check the voltage of pin (26) of IC401.
>2.5VD.C.
Is there a signal at pin (18) of IC401 ?
NO
Replace X501.
YES
Replace IC401.
<2.5VD.C.
Replace IC401.

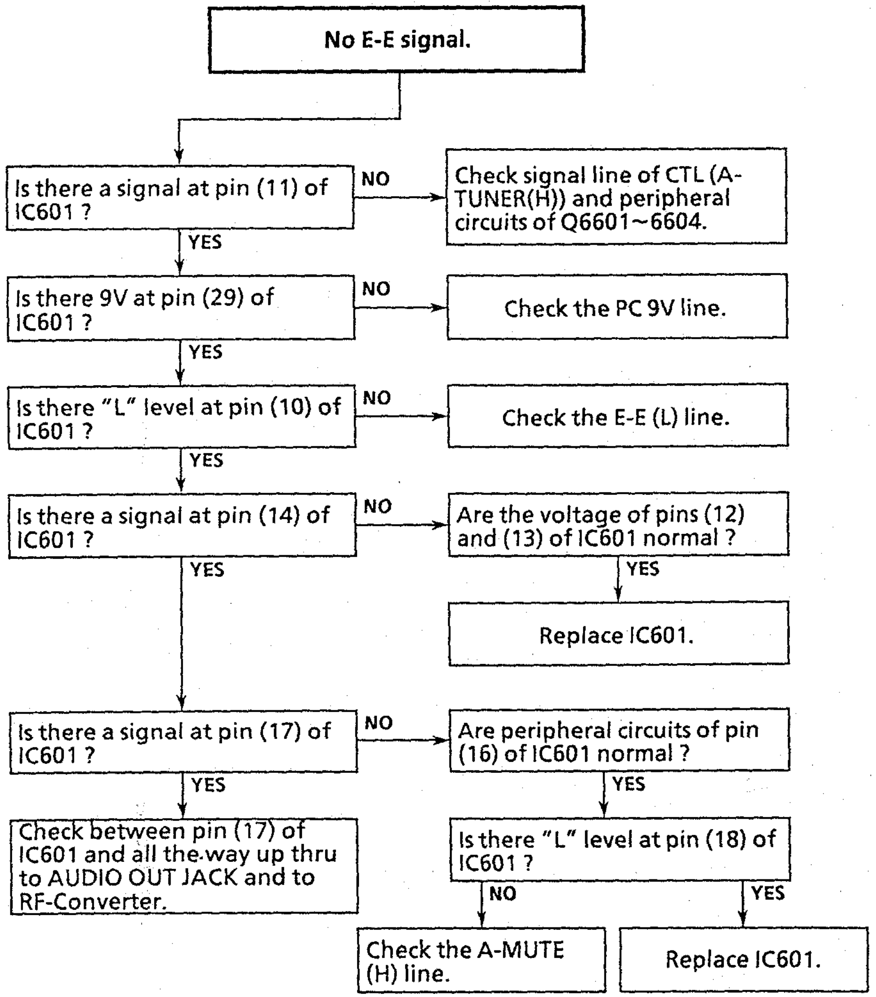
FLOW CHART NO. 20

E-E MODE TROUBLESHOOTING


No E-E signal.
Is there a signal at pin (37) of IC401 ?
NO
YES
Is there a signal at pin (8) of IC2201 ?
NO
YES
Check between pin (8) of IC2201 and the way up thru to pin (37) of IC401.
Is there a signal at pin (3) of IC2201 ?
NO
Check the IF UNIT.
Check the 5V at pin (9) of IC2201.
Check the DC level at pin (7) of IC2201 (DC "L" level).
Check the DC level at pin (4) of IC2201 (DC "H" level).
Is there a signal at pin (34) of IC401 ?
NO
YES
Check between pin (34) of IC401 and all the way up thru to Video output terminal.
Is there 5V at pins (35) and (28) of IC401 ?
NO
YES
Check Q206 and the PC9V line.
Is there a signal at pin (3) of IC401 ?
NO
YES
Check R203 (E-E level control).
Is there a signal at pin (4) of IC401 ?
NO
YES
Check peripheral circuits of Q212~Q215.
Replace IC401.
NO
Check if the DC level at the anode of D202 is "H".
NO
Check pin (6) of CB connector (E-E (L) line).

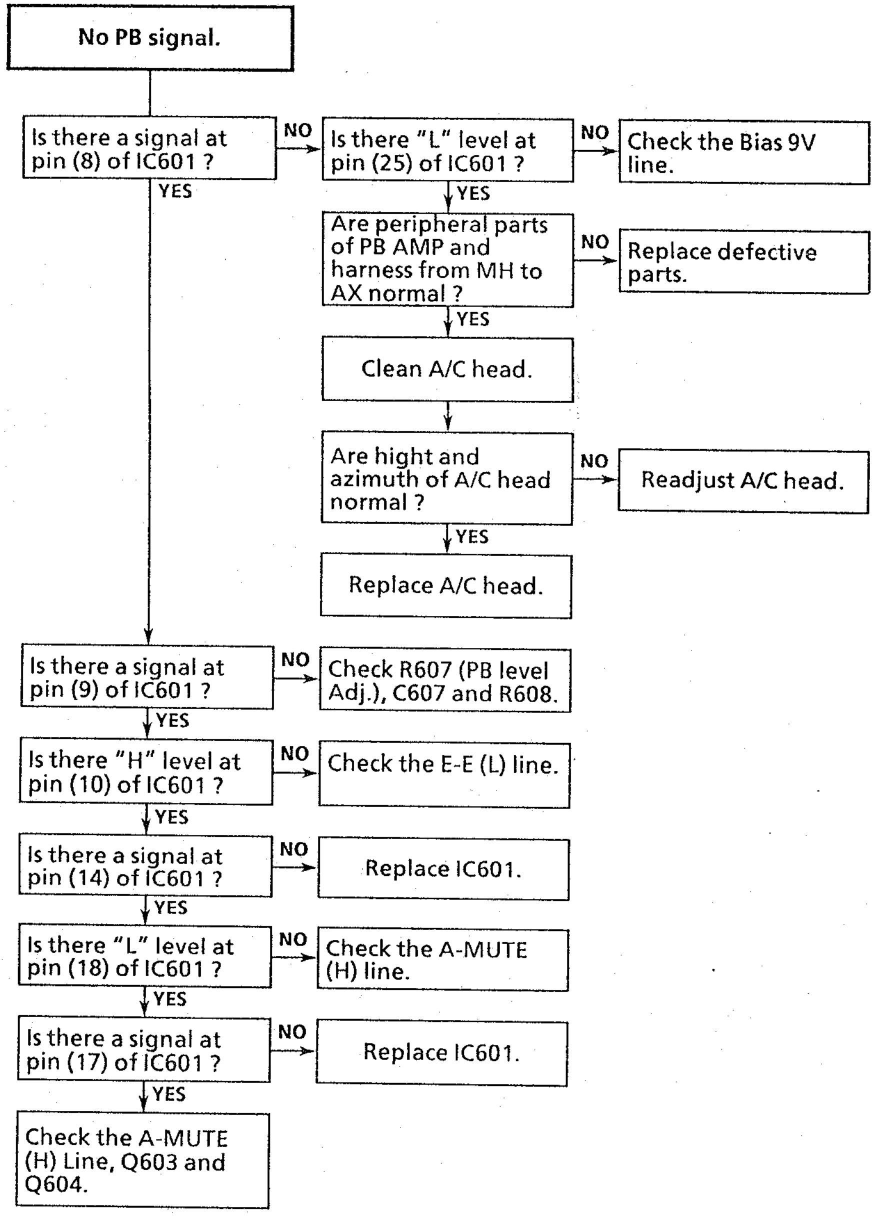
FLOW CHART NO. 21

E-E MODE TROUBLESHOOTING (AUDIO)


No E-E signal.
Is there a signal at pin (11) of IC601 ?
NO
Check signal line of CTL (A-TUNER(H)) and peripheral circuits of Q6601~6604.
YES
Is there 9V at pin (29) of IC601 ?
NO
Check the PC 9V line.
YES
Is there "L" level at pin (10) of IC601 ?
NO
Check the E-E (L) line.
YES
Is there a signal at pin (14) of IC601 ?
NO
Are the voltage of pins (12) and (13) of IC601 normal ?
YES
Replace IC601.
YES
Is there a signal at pin (17) of IC601 ?
NO
Are peripheral circuits of pin (16) of IC601 normal ?
YES
Check between pin (17) of IC601 and all the way up thru to AUDIO OUT JACK and to RF-Converter.
YES
Is there "L" level at pin (18) of IC601 ?
NO
YES
Check the A-MUTE (H) line.
Replace IC601.

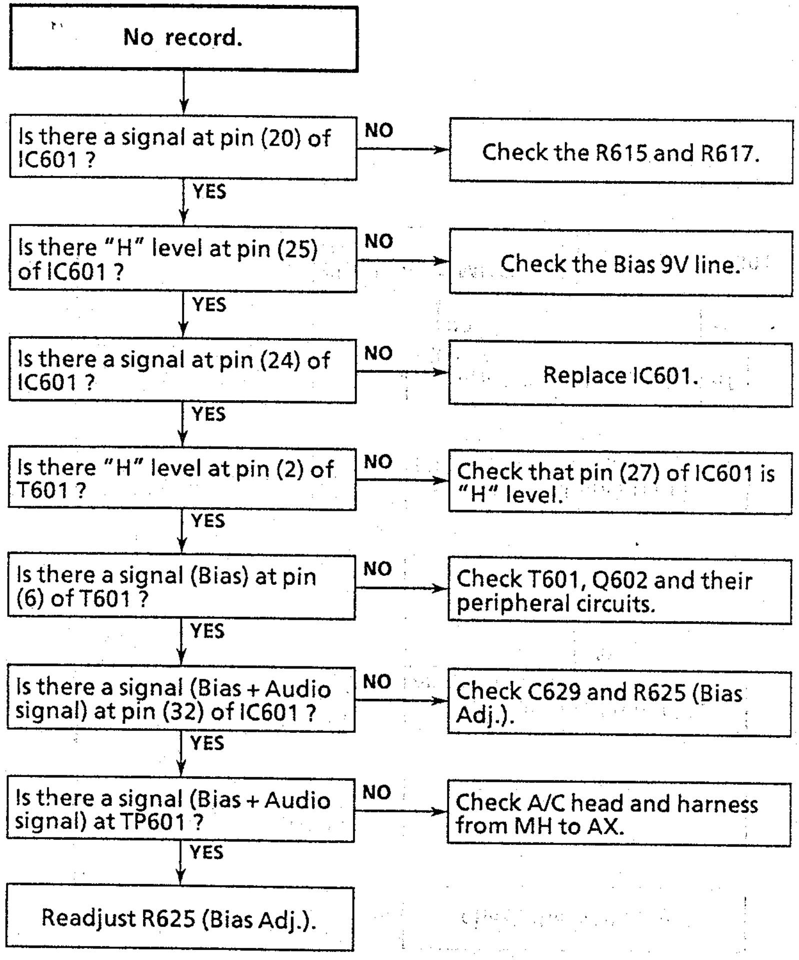
FLOW CHART NO. 22

PLAYBACK MODE TROUBLESHOOTING


No PB signal.
Is there a signal at pin (8) of IC601 ?
NO
Is there "L" level at pin (25) of IC601 ?
NO
Check the Bias 9V line.
YES
Are peripheral parts of PB AMP and harness from MH to AX normal ?
NO
Replace defective parts.
YES
Clean A/C head.
Are hight and azimuth of A/C head normal ?
NO
Readjust A/C head.
YES
Replace A/C head.
YES
Is there a signal at pin (9) of IC601 ?
NO
Check R607 (PB level Adj.), C607 and R608.
YES
Is there "H" level at pin (10) of IC601 ?
NO
Check the E-E (L) line.
YES
Is there a signal at pin (14) of IC601 ?
NO
Replace IC601.
YES
Is there "L" level at pin (18) of IC601 ?
NO
Check the A-MUTE (H) line.
YES
Is there a signal at pin (17) of IC601 ?
NO
Replace IC601.
YES
Check the A-MUTE (H) Line, Q603 and Q604.

FLOW CHART NO. 23

RECORDING MODE TROUBLESHOOTING


No record.
Is there a signal at pin (20) of IC601 ?
NO
Check the R615 and R617.
YES
Is there "H" level at pin (25) of IC601 ?
NO
Check the Bias 9V line.
YES
Is there a signal at pin (24) of IC601 ?
NO
Replace IC601.
YES
Is there "H" level at pin (2) of T601 ?
NO
Check that pin (27) of IC601 is "H" level.
YES
Is there a signal (Bias) at pin (6) of T601 ?
NO
Check T601, Q602 and their peripheral circuits.
YES
Is there a signal (Bias + Audio signal) at pin (32) of IC601 ?
NO
Check C629 and R625 (Bias Adj.).
YES
Is there a signal (Bias + Audio signal) at TP601 ?
NO
Check A/C head and harness from MH to AX.
YES
Readjust R625 (Bias Adj.).

REPLACEMENT OF TIMER IC5003 (E^{2}PROM)

Servicing precautions
When the IC5003 E^{2}PROM (VHIBR93C46A-1, VHIXRM9346A-1 or VHICAT93C46-1) in the timer unit has been replaced, make the following reprogramming.
Depending on models, the IC5003 E^{2}PROM has been factory-adjusted for its memory function. It is therefore necessary to reprogram the memory function for the model in question. Note that the servo circuit requires readjustments for the slow and still modes.

Memory function reprogramming

1. Push the OPERATE button to turn the power on.
2. Press the TEST button on the timer PWB to get the unit in the TEST mode.
3. Push the CH SET button to get the unit in the CH SET mode.
4. Using the CHANNEL (+) AND (−) buttons, select the right function numbers from among I48-I63, which appear in the fluorescent display tube, referring to the E^{2}PROM map. Push the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).
   * When the DISPLAY button has been pushed (ON), the memory function No. starts flashing.
   * When the CLEAR button has been pushed (OFF), the memory function No. lights up.
5. Press the CH SET button to clear the CH SET mode.
6. Make the cathode of the timer D5004 and TJ203 on timer PWB short circuited, and the settings will be displayed in hexadecimal notation. Now you can see if the settings are correct.
   Example:
   "ON" and "OFF" are taken as "1" and "0" respectively. The numbers I48 to I63 are divided into four groups and each group's setting is displayed in hexadecimal notation.

I63	I62	I61	I60	I59	I58	I57	I56	I55	I54	I53	I52	I51	I50	I49	I48
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
⇩ 4				⇩ 2				⇩ 0				⇩ 0			

   "4200" appears in the fluorescent display tube.
7. Finally push the ALC button to clear the TEST mode.

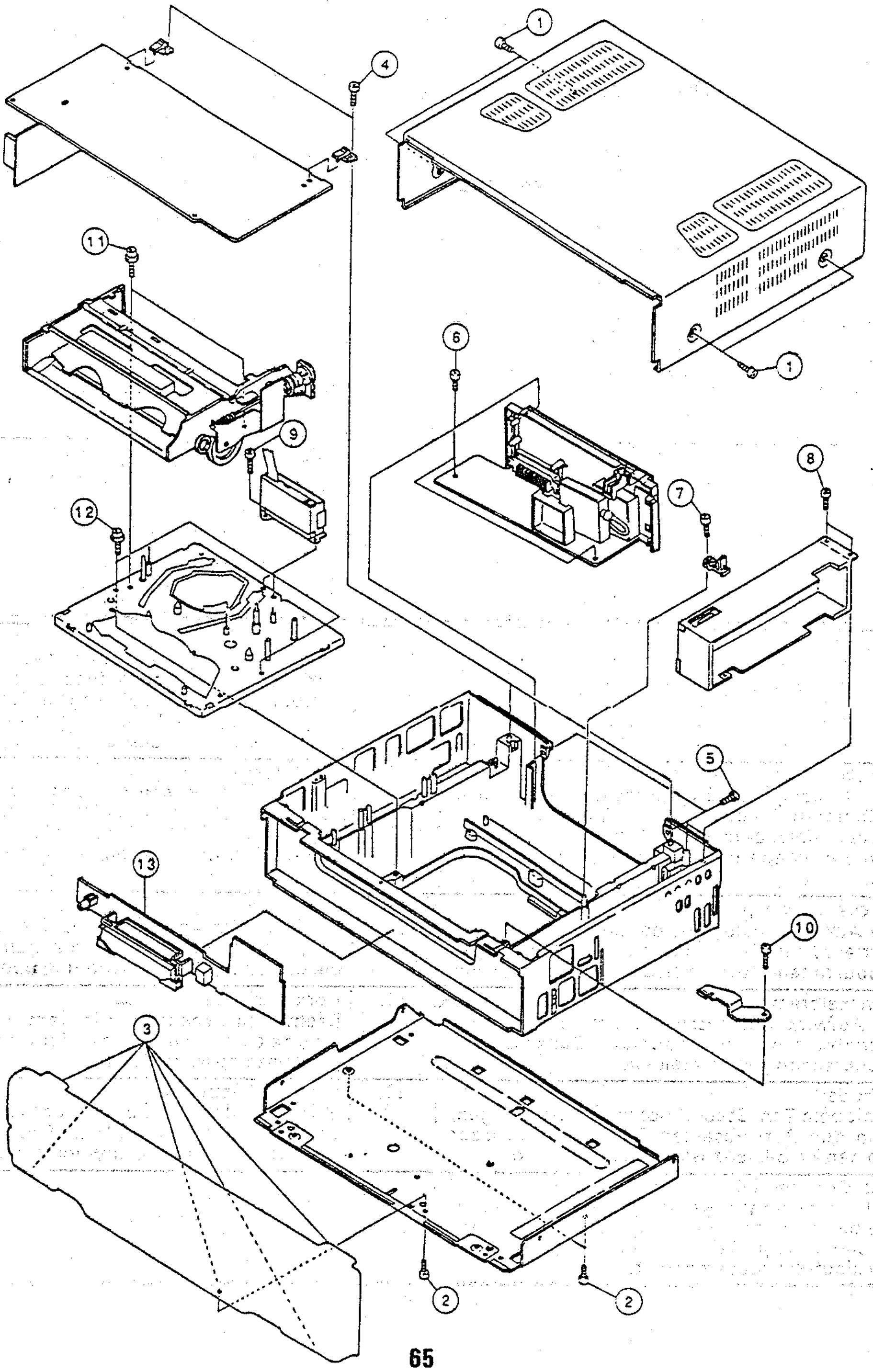
E^{2}PROM map

Fun No	Function name														
I63	I^{2}C														
I62	SIMUL	○	○	○	○	○	○	○	○	○	○	○	○	○	○
I61	MULTI														
I60	OEM					○							○	○	
I59	COLOUR2					○							○		
I58	COLOUR1					○							○		
I57	COLOUR0	○	○	○	○		○	○	○	○	○	○		○	○
I56	GERMANY														
I55	AUX2														
I54	HYPER			○							○	○			
I53	UHF						○		○					○	
I52	FRENCH														
I51	LP							○	○	○	○	○	○	○	○
I50	VPS		○	○						○	○				
I49	Hi-Fi														
I48	VCR				○										○
Displayed on screen		4200	4204	4244	4201	5C00	4220	4208	4228	420C	424C	4248	5C08	5228	4209
MODEL'S (VC-)		A43S A43SM A33X A38X A43X A33BP A43YM A33LM	A43GM A265 GM	A43SV	A33NZ A38NZ	B34N B35D B36B	A33HM A43HM	A48X A63X A53SM A63YM A63BP A53YM	A48HM A63HM	A53GM	A63SV A63GM	A63S A63SM	B67NT B78DT B68BTN	B66WT	A63NZ

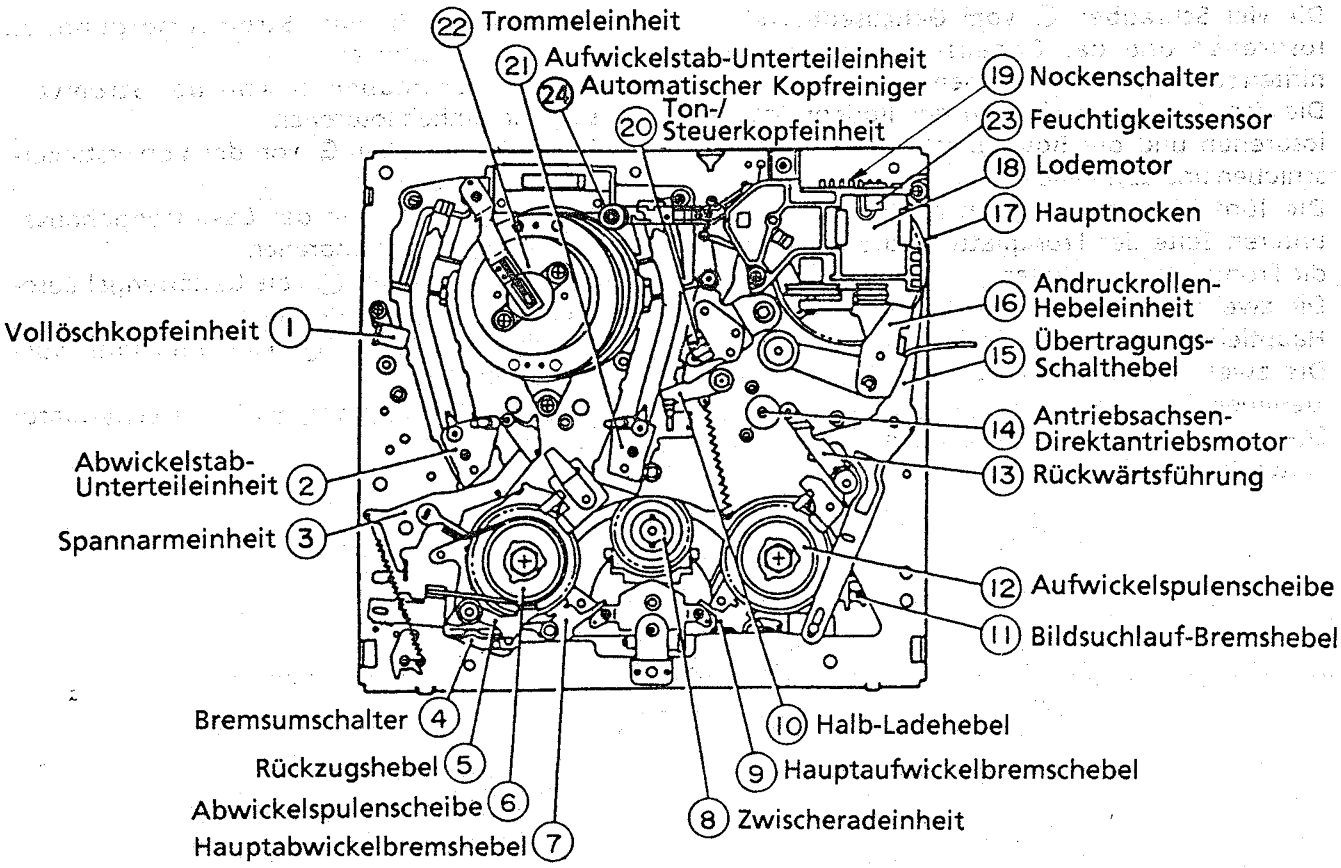
Note: "○" : ON " " : OFF

AUSBAU UND WIEDERZUSAMMENBAU

1. Die vier Schrauben ① vom Gehäuseoberteil losdrehen und das Gehäuseoberteil nach hinten schieben und abnehmen.
2. Die drei Schrauben ② von der Bodenplatte losdrehen und die Bodenplatte nach hinten schieben und abnehmen.
3. Die fünf Klammern ③ von der oberen und unteren Seite der Frontplatte losdrehen, und die Frontplatte abnehmen.
4. Die zwei Schrauben ④ und die Klammer vom Hauptleiterplattenhalter entfernen.
5. Die zwei Schrauben ⑤ von der Antennenklemmenplatte losdrehen.
6. Die zwei Schrauben ⑥ von der Tuner-ZF-Leiterplatte losdrehen.
7. Die Schraube ⑦ vom Stromversorgungseinheithalter losdrehen.
8. Die zwei Schrauben ⑧ von der Stromversorgungseinheit losdrehen.
9. Die zwei Schrauben ⑨ von der Vorverstärker-Einheit losdrehen.
10. Die Schraube ⑩ von der Cassettengehäuse-Steuerungseinheit losdrehen.
11. Die zwei Schrauben ⑪ , die Cassettengehäuse-Steuerungseinheit befestigen.
12. Die drei Schrauben ⑫ vom Mechanismus-Chassis losdrehen.
13. Die zwei Klammern von der Timer-Leiterplatte ⑬ freigeben.

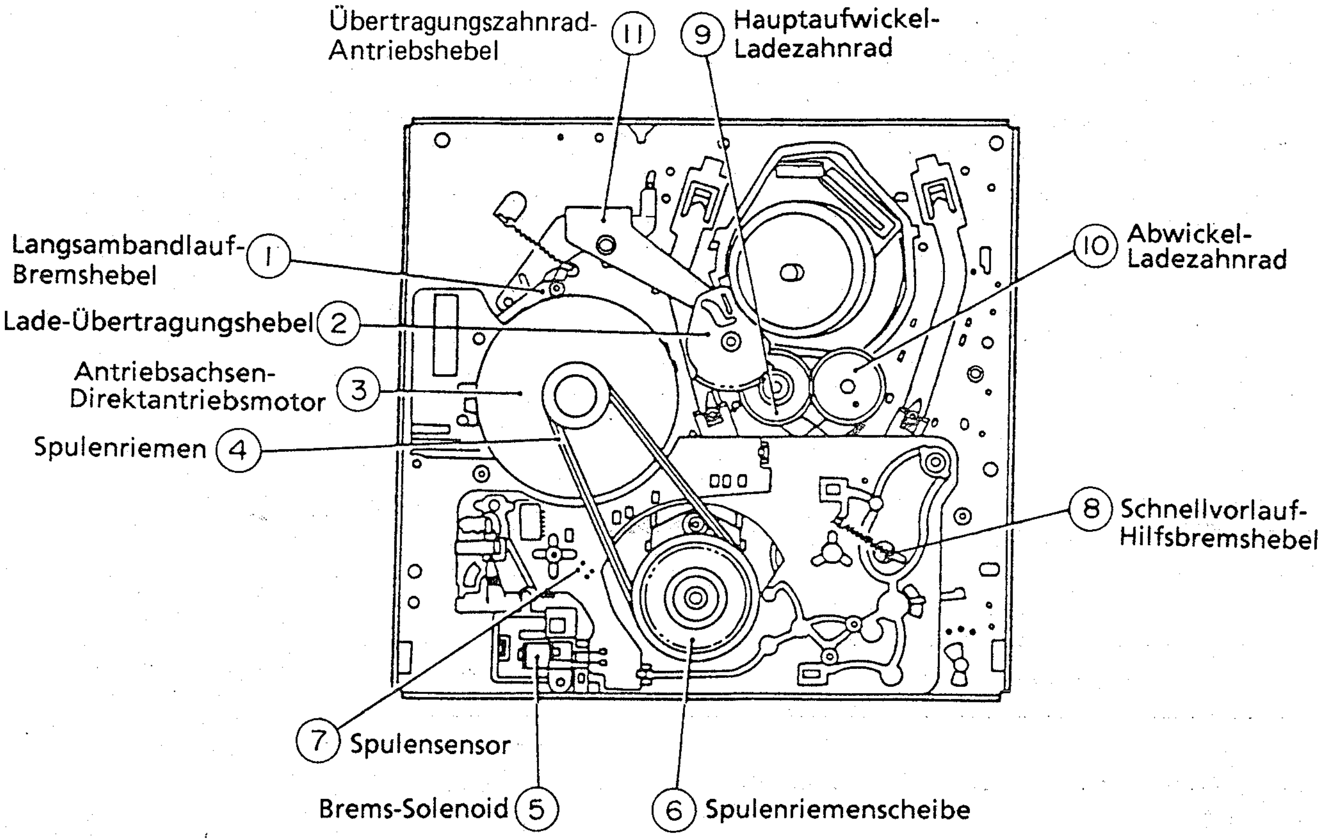


FUNKTIONEN DER WICHTIGSTEN MECHANISCHEN TEILE (DRAUFSICHT)


㉒ Trommeleinheit
㉑ Aufwickelstab-Unterteileinheit
㉔ Automatischer Kopfreiniger
⑳ Ton-/Steuerkopfeinheit
⑲ Nockenschalter
㉓ Feuchtigkeitssensor
⑱ Lodemotor
⑰ Hauptnocken
⑯ Andruckrollen-Hebeleinheit
⑮ Übertragungs-Schalthebel
⑭ Antriebsachsen-Direktantriebsmotor
⑬ Rückwärtsführung
⑫ Aufwickelspulenscheibe
⑪ Bildsuchlauf-Bremshebel
① Vollöschkopfeinheit
② Abwickelstab-Unterteileinheit
③ Spannarmeinheit
④ Bremsumschalter
⑤ Rückzugshebel
⑥ Abwickelspulenscheibe
⑦ Hauptabwickelbremshebel
⑩ Halb-Ladehebel
⑨ Hauptaufwickelbremschebel
⑧ Zwischeradeinheit

Nr.	Funktion	Nr.	Funktion
1.	Vollöschkopfeinheit Alle Bandaufzeichnungen in der Aufnahme-Betriebsart löschen.	13.	Rücklaufführung Zieht das Band in der Bildsuchrücklauf-Betriebsart heraus und steuert mit den oberen und unteren Führungen die Bandantriebshöhe.
3.	Spannarmeinheit Ermittelt die Bandspannung während des Bandlaufs und bremst die Abwickelspulenscheibe via das Spannband.	15.	Übertragungsumschalthebel Überträgt die Operation des Hauptnockens an den Bremsumschalter und betätigt die Rücklaufführung.
4.	Bremsumschalter Die Bremsenposition in Übereinstimmung mit den Betriebsarten wie Stopp und Wiedergabe einstellen.	16.	Andruckrollen-Hebeleinheit Drückt das Band während des Bandlaufs an die Antriebsachse. Der rechte Zapfen schaltet die Kupplung der Cassettengehäusesteuerung auf "Cassettenauswurf". Die Cassette wird daraufhin aus dem Bandlaufwerk ausgestoßen.
5.	Rückzugshebel Bewirkt den Rückzug der Abwickelspulenscheibe bis zu einem bestimmten Grad, um einen Banddurchhang während des Halblade-und Ladevorgangs und beim Umschalten von Wiedergabe auf Bildsuchrücklauf zu verhindern.	17.	Hauptnocken Dreht sich während des Ladevorgangs im Uhrzeigersinn und beim Entladen gegen den Uhrzeigersinn. Dabei wird der Umschalter gemäß der unterschiedlichen Betriebsarten bewegt.
7.	Hauptabwickelbremshebel Bremst die Abwickelspulenscheibe, um beim Stoppen in den Betriebsarten Bandvorlauf und Bandrücklauf einen Banddurchhang zu vermeiden.	18.	Lademotor Mechanischer Antrieb des Laufwerks. Die Kraft wird über einen Riemenantrieb auf den Hauptnocken und die Cassettengehäusesteuerung übertragen.
9.	Hauptaufwickelbremshebel Bremst die Aufwickelspulenscheibe, um beim Stoppen in den Betriebsarten Bandvorlauf und Bandrücklauf einen Banddurchhang zu vermeiden.	19.	Nockenschalter Dreht sich synchron mit dem Hauptnocken und ermittelt mit dem internen Schalter die Position für jede einzelne Betriebsart.
10.	Halb-Ladehebel Das Band mit dem Ton-/Steuerkopf in Kontakt bringen, indem es in den Betriebsarten Schnellvorlauf oder Rücklauf in den Halb-Ladezustand gebracht wird.	23.	Feuchtigkeitssensor Ein Bestandteil, der die Feuchtigkeit inder Einheit erkennt. Beim Empfinden der Feuchigkeit wird dieser Teil aktivert, um das Laufwerk zu unterberechen.
11.	Bildsuchlauf-Bremshebel Der Hebel ist normalerweise mit der Abwickelspulenscheibe in Kontakt und zeigt eine bestimmte Bremswirkung. Eine größere Bremswirkung wird in der Bildsuchrücklauf-Betriebsart erzielt.		

FUNKTIONEN DER WICHTIGSTEN MECHANISCHEN TEILE (ANSICHT VON UNTEN)


Übertragungszahnrad-Antriebshebel ⑪
⑨ Hauptaufwickel-Ladezahnrad
Langsambandlauf-Bremshebel ①
⑩ Abwickel-Ladezahnrad
Lade-Übertragungshebel ②
Antriebsachsen-Direktantriebsmotor ③
Spulenriemen ④
⑧ Schnellvorlauf-Hilfsbremshebel
⑦ Spulensensor
Brems-Solenoid ⑤
⑥ Spulenriemenscheibe

Nr.	Funktion	Nr.	Funktion
1.	Langsambandlaufhebel Berührt in der Zeitlupen-/Standbild-Betriebsart den mit dem Hauptnocken verbundenen Antriebsachsen-Direktantriebsmotor und bremst ihn zu einem bestimmten Grad ab.	7.	Spulensensor Ein Bauteil, welches das Licht auf die Reflexionsplatte an der Unterseite der Spulenscheibe abstrahlt und die Rotation der Spulenscheibe durch Auswertung des refektierten Lichts ermittelt.
3.	Antriebsachsen-Direktantriebsmotor Mechanischer Antrieb des Laufwerks. Die Kraft wird über einen Riemenantrieb übertragen.	8.	Schnellvorlauf-Hilfsbremshebelfeder Bremst die Abwickelspulenscheibe in den Betriebsarten Schnellvorlauf und Rücklauf bis zu einen bestimmten Grad ab.
4.	Spulenriemen Überträgt die Kraft, um das Band zur Spulenscheibe zu befördern.	9.	Hauptaufwickel-Ladezahnrad Schaltet den Aufwickelstab-Unterteil und die Führungsrolle durch das Lade-Übertragungszahnrad um und legt das Band um die Trommel. Ferner überträgt das Ladezahnrad die Kraft auf das Abwickel-Ladezahnrad.
5.	Bremsmagnet Stoppt den Bremsumschalter in den Betriebsarten Schnellvorlauf und Rücklauf und setzt ihn in der Stopp-Betriebsart wieder frei.	10.	Abwickel-Ladezahnrad Schaltet den Abwickelstab-Unterteil und die Führungsrolle durch das Hauptaufwickel-Ladezahnrad und legt das Band um die Trommel.
6.	Spulenscheibe Überträgt die Kraft des Antriebsachsen-Direktantriebsmotors via das Spulenzwishenrad auf die Spulenscheibe.	11.	Übertragungszahnrad-Antriebshebel Überträgt die Bewegung des Hauptnockens via dem Lade-Übertragungshebel auf das Hauptaufwickel-Ladezahnrad.

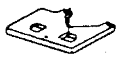
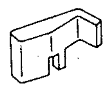
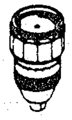
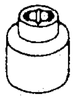
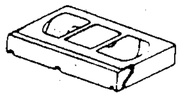
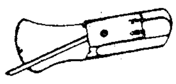
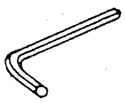
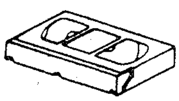
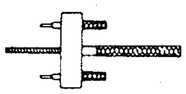
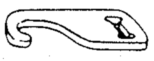
EINSTELLUNG, ERNEUERUNG UND MONTAGE DER MECHANISCHEN TEILE

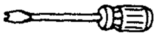
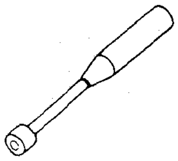
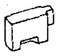
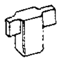
Hier möchten wir einige relativ einfache Wartungsschritte in diesem Bereich vorstellen und beziehen uns nicht auf die komplizierteren Reparaturen, welche den Einsatz von Spezialgeräten und -werkzeugen erforderlich machen (z.B. der Zusammenbau oder Austausch der Kopftrommel).

Wir glauben, daß die unten aufgeführten, einfach zu bedienenden Werkzeuge, bei der periodischen Wartung mehr als willkommen sind, um das Gerät in effizientem Betriebszustand zu erhalten.

ERFORDERLICHE WERKZEUGE ZUR EINSTELLUNG DER MECHANISCHEN TEILE

Für ordnungsgemäße Wartung und zufriedenstellende Reparatur sind die folgenden Werkzeuge erforderlich.

Nr.	Vorrichtung	Teil Nr.	Kode	Aussehen	Bemerkungen
1	Spulenscheibenhöhen-Einstellvorrichtung	JiGRH0002	BR		Dieses Vorrichtungen dienen zum Überprüfen und Einstellen der Spulenscheibenhöhe.
2	Hauptschablone	JiGMP0001	BY		
3	Ton-/Steuerkopfneigungs-Einstellvorrichtung	JiGACH-F18	BU		Diese Vorrichtung dient zur Einstellung der Ton-/Steuerkopfneigung.
4	Drehmomentmesser (90 g)	JiGTG0090	CM		Diese Vorrichtungen dienen zum Überprüfen und Einstellen des Drehmoments der Auf-und Abwickelspulen.
	Drehmomentmesser (1,2 kg)	JiGTG1200	CN		
5	Drehmomentmesserkopf	JiGTH0006	AW		
6	Cassetten-Drehmomentmesser	JiGVHT-063	CZ		Dieser Cassetten-Drehmomentmesser dient zum Überprüfen und Einstellen des Drehmoments der Auf-und Abwickelspulen und zum Messen des Bandrückzugs.
7	Spannungsmesser (300 g)	JiGSG0300	BF		Diese beiden Spannungsmesser (300 g und 2,0 kg) werden für Spannungsmessungen verwendet.
	Spannungsmesser (2,0 kg)	JiGSG2000	BS		
8	Innensechskantschlüssel (0,9mm)	JiGHW0009	AE		Diese Schlüssel dienen zum Lösen oder Anziehen von speziellen Innensechskantschrauben.
	Innensechskantschlüssel (1,2mm)	JiGHW0012	AE		
	Innensechskantschlüssel (1,5mm)	JiGHW0015	AE		
9	Abgleichband (PAL)	VROCPSV	CK		Dieses Band dient insbesondere zur elektrischen Feineinstellung.
	Abgleichband (PAL · LP)	VROUBZFS	BP		
10	Kopftrommel-Auswechselvorrichtung	JiGDT-0001	BG		Diese Vorrichtung dient zum Auswechseln der oberen Kopftrommel des Videorecorders.
11	Spannungsmesseradapter	JiGADP003	BK		Dieser Adapter wird für den Spannungsmesser verwendet Vorrichtung zum Einstellen des Spiels des umlaufenden Spannungswandlers.

Nr.	Vorrichtung	Teil Nr.	Kode	Aussehen	Bemerkungen
12	Spezialschraubendreher	JiGDRiVERH-4	AP		Dieser Schraubendreher dient zur Einstellung der Führungsrollenhöhe.
13	Spannband- und Spannplatten-Einstellvorrichtung	JiGDRiVER-6	BM		Diese Vorrichtung dient zum Einstellen des Spannbandes und der Spannplatte.
14	Drehmoment-Schraubendreher	JiGTD1200	CB		Dieses Werk zeug dient zum Festschrauben von Kunststoffteilen. Das vorgeschriebene Anzugsmoment beträgt 5 kg.
15	Stecknuß-Schraubendreher	JiGDRiVER110-7	AS		Dieser Stecknuß-Schraubendreher dient zur Höheneinstellung des Ton-/Steuerkopfes sowied der X-Position.
		JiGDRiVER110-4	AV		Dieser Stecknuß-Schraubendreher dient zur Höheneinstellung der Rückhalteführung.
16	Rückhalteführung-Höheneinstellvorrichtung	JiGGH-F18	BU		Diese Vorrichtung dient zur Höheneinstellung der Rückhalteführung
17	Rückwärtsführungs-Höheneinstellvorrichtung	JiGRVGH-F18	BU		Diese Vorrichtung dient zur Höheneinstellung der Rückwärtsführung.

MECHANISCHE TEILE, DIE REGELMÄSSIG ÜBERPRÜFT WERDEN MÜSSEN

Die folgendeTabelle als Anleitung benutzen, um die mechanischen Teile in gutem Betriebszustand zu erhalten.

Wartungsabstände alle / Teile	500 Std.	1000 Std.	1500 Std.	2000 Std.	3000 Std.	Störung	Bemerkungen
Führungsrolleneinheit	□	□	□	□	□	Querstörungen, Kopf gelegentich bllockiert	Bei unregelmäßiger Drehung oder starker Vibration auswechseln.
Abwickel-Widerstandsrolle	□	□	□	□	□		
Abwickel-Widerstandsrolle (Innenloch und-welle)		□		□	□		Mit reinem, hochwertigen Isopropylalkohol reinigen.
Abwickel-Wiederstandsrolleflansch	□	□	□	□	□		Den Bandkontaktbereich mit der vorgeschriebenen Reinigungsflüssigkeit reinigen.
Rückhalteführung	□	□	□	□	□		
Schrägstab	□	□	□	□	□		
Videokopf	□	○□	□	○□	○□	Schlechter Rauschabstand, keine Farbwiedergabe	Den Bandkontaktbereich mit der vorgeschriebenen Reinigungsflüssigkeit reinigen.
Vollöschkopf	□	□	□	□	□	Schlechter Farbwiedergabe, Schwebungen	
Ton-/Steuerkopf	□	□	□	□	□	Klangwiedergabe zu leise oderverzerrt	
Antriebsachsen-Direktantriebsmotor	□	□	□	□	○	Kein Bandtransport, ungleichmäßige Farbwiedergabe	
Andruckrolle	□	□	□	□	○	Kein Bandtransport, Bandschlaufen	Die Gummiteile und den Gummikontaktbereich mit der vorgeschriebenen Reinigungsflüssigkeit reinigen.
Spulenriemen		□		○	□	Kein Bandtransport, Bandschlaufen, kein Schnellvorlauf/Rücklauf	
Laderiemen		□		○	□	Cassette nicht geladen bzw. Band nicht eingezogen	
Cassetten-Laderiemen		□		○	□		
Spannbandeinheit					○	Laterale Bildschwankungen	
Lademotor					○	Cassette nicht geladen bzw. nicht entladen	
Automatischer Kopfreiniger		○		○	○		Die Walze des Reinigers bei Verschleiß auswecheln. Die AHC-Walzeneinheit einfach gegen eine neue auswechseln.
Spulenblock*						Siehe Tabelle unten	
*** Für die Wartung des Spulenblocks auf die nachfolgende Tabelle Bezug nehmen.**							
Ab-/Aufwickelspulenscheiben		□△		△○	□△	Kein Bandtransport, Band locker	Mit reinem, hochwertigen Isopropylalkohol reinigen.
Videosuchlauf-Bremshebel				○			
Zwischenradeinheit				○		Kein Bandtransport	
Spulenriemenscheibe		□△		□○	□△		
Haupt-Ab-/Aufwickelbremshebel				○		Bandschlaufen	

HINWEIS: ○: Auswechseln des betreffenden Teils.
□: Reinigen (Zum Reinigen ein flusenfreies, mit reinem Isopropylalkohol angefeuchtetesTuch verwenden).
△: Nachfüllen von Öl (Die angegebene Stelle muß nach jeweils 1000 Betriebsstunden mit hochwertigen Spindelöl geschmiert werden.)

Bei diesem Modell gibt es keine Einstellteile für Drehmomente, Spannung usw. Falls ein Meßwert außerhalb des vorgeschriebenen Bereichs liegt, das betreffende Teil reinigen und auswechseln.

AUS- UND EINBAUEN DES CASSETTENGEHAUSES

- **Ausbau**

1. Das Gerät in die Cassettenauswurf - Betriebsart bringen.
2. Den Videorecorder vom Netz abtrennen.
3. Die nachfolgenden Schritte in der vorgegebenen Reihenfolge ausführen.
   a) Den Cassetten - Laderiemen ① entfernen.
   b) Das Flachkable ② abtrennen.
   c) Die Cassettengehäuseschrauben ③ losdrehen.
   d) Das Cassettengehäuse verschieben und nach oben ④ herausziehen.

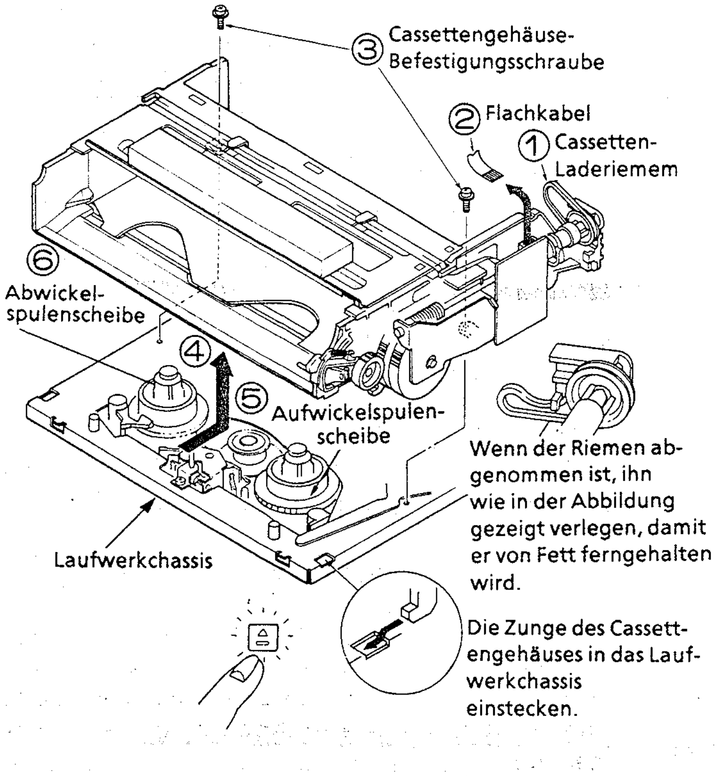

③ Cassettengehäuse-Befestigungsschraube
② Flachkabel
① Cassetten-Laderiemem
⑥ Abwickel-spulenscheibe
④
⑤ Aufwickelspulen-scheibe
Laufwerkchassis
Wenn der Riemen abgenommen ist, ihn wie in der Abbildung gezeigt verlegen, damit er von Fett ferngehalten wird.
Die Zunge des Cassettengehäuses in das Laufwerkchassis einstecken.

Abbildung 1-1.

- **Einbau**

1. Vor dem Einbau des Cassettengehäuses das Gerät in eingeschaltetem Zustand in die Stopp-Betriebsart bringen und dann das Netzkabel abziehen.
   (Das Hauptgerät befindet sich in der Auswurf - Betriebsart.)
2. Die Einbauschritte entsprechen den umgekehrten Ausbauschritten.

Hinweise:

1. Das Netzkabel vor dem Ein - und Ausbau unbedingt abziehen.
2. Es darf kein Fett auf den Cassetten - Laderiemen gelangen. Falls Fett auf dem Riemen festgestellt wird, diesen gründlich reinigen.
3. Wenn ein Schraubendreher mit magnetisierter Spitze benutzt wird, diese unbedingt von Ton - / Steuerkopf, Vollöschkopf bzw. der Trommel fern-halten.
4. Beim Ein - und Ausbau unbedingt darauf achten, daß das Cassettengehäuse oder Werkzeuge nicht gegen den Führungsstift, die Trommel oder andere Bauteile geschlagen werden.
5. Beim Ein-oder Ausbau des Cassettengehäuses muß das Gerät in die Cassettenauswurf - Betriebs-art gebracht werden.
6. Nach dem Einbau die Cassette einmal in die Cassettengehäuse - Steuereinheit laden. (Wenn die Steuereinheit danach normal funktioniert, sind die Phasen des Bandlaufwerks und die Cassettensteuerung nach dem Auswurf richtig eingestellt.)

UBERPRÜFUNG DER MECHANISCHEN FUNKTION OHNE EINGELEGTE CASSETTE

Bei eingeschaltetem Gerät lassen sich die allgemeinen Funktionen ohne eingelegte Cassette überprüfen.

Folgende Punkte sind zu beachten:

1. Den Bildsuchlauf überprüfen, indem die Aufwickelspulenscheibe ⑤ von Hand vor - oder zurückgedreht wird. Wenn die Aufwickelspulenscheibe nicht gedreht wird, arbeitet der Spulensensor so, daß das Bandlaufwerk in die Auswurf - Betriebsart geschaltet wird.
2. Beim Drücken der Stopptaste bleibt das Bandlaufwerk nicht in der normalen Stopposition stehen. Es schaltet in die Auswurf - Betriebsart und bleibt dann stehen.
3. Wenn die Stopptaste in den Betriebsarten Wiedergabe, Rückwärts - Bildsuchlauf und Vorwärts - Bildsuchlauf gedrückt wird, dreht sich die Abwickelspulenscheibe ⑥ beim Umschalten in die Auswurf - Betriebsart noch für wenige Sekunden weiter, um das Band zu straffen. In diesem Fall ist die Aufwickelspulenscheibe ⑤ leicht von Hand zu drehen. Die Abwickelspulenscheibe ⑥ bleibt daraufhin stehen, was zu einer Verringerung der Arbeitszeit führt.

AUSWECHSELN DES SCHNECKENRADS

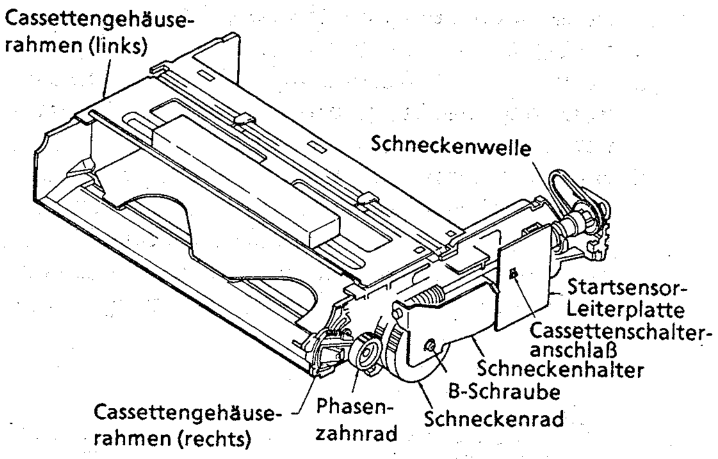

Cassettengehäuse-rahmen (links)
Schneckenwelle
Startsensor-Leiterplatte
Cassettenschalter-anschlaß
Schneckenhalter
B-Schraube
Schneckenrad
Phasen-zahnrad
Cassettengehäuse-rahmen (rechts)

Abbildung1-2.

● Ausbau

1. Die Cassettenschalteranschlüsse (Nr. 16, 17) von der Startsensor - Leiterplatte ablöten.

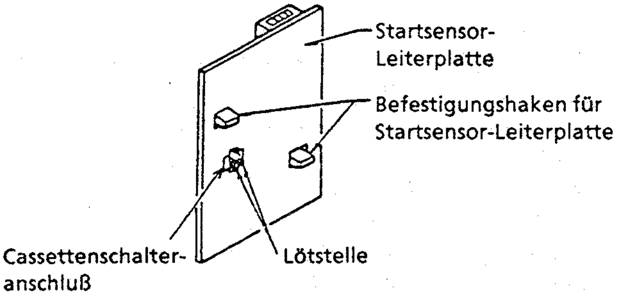

Startsensor-Leiterplatte
Befestigungshaken für Startsensor-Leiterplatte
Cassettenschalter-anschluß
Lötstelle

Abbildung 1-3.

2. Die Startsensor - Leiterplatte anheben, während die Halterungshaken nach innen gedrückt werden.

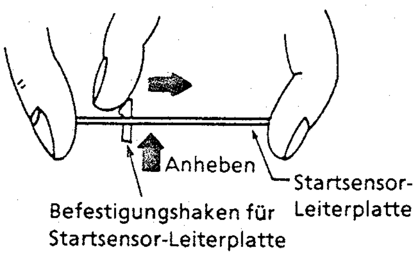

Anheben
Startsensor-Leiterplatte
Befestigungshaken für Startsensor-Leiterplatte

Abbildung 1-4.

3. Eine B - Schraube losdrehen, um die Schneckenhalterung abzunehmen.
   Hinweis:
   Das Schneckenwellenlager kann leicht aus seiner Position geraten. Vorsicht, damit keine Teile verlorengehen.

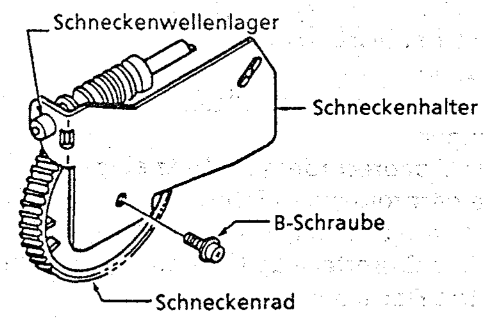

Schneckenwellenlager
Schneckenhalter
B-Schraube
Schneckenrad

Abbildung 1-5.

4. Die Schneckenwelle, Riemenscheibe sowie den Cassetten - Laderiemen vom rechten Cassettengehäuserahmen entfernen.

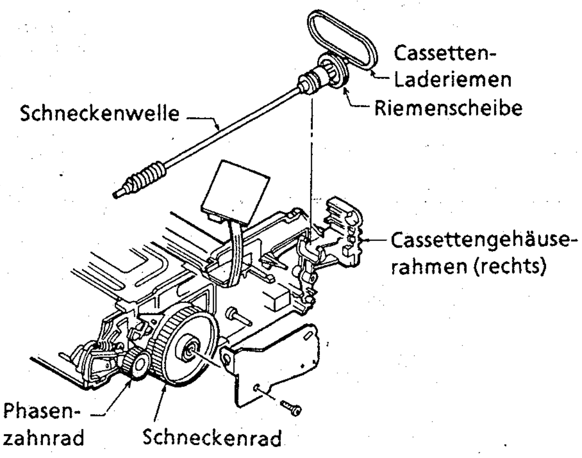

Cassetten-Laderiemen
Riemenscheibe
Schneckenwelle
Cassettengehäuse-rahmen (rechts)
Phasen-zahnrad
Schneckenrad

Abbildung 1-6.

5. Den Gleitstückstift unmittelbar über dem Schneckenrad (Abbildung 1-7) einsetzen. (Der Gleitstückhalter ist nun an zwei Stellen arretiert. Die Arretierung wie in Abbildung 1 - 8 aufheben.)
6. Das Schneckenrad zu sich herausziehen, indem der Schalterhebel nach oben gedrückt wird (Abbildung 1 - 7).

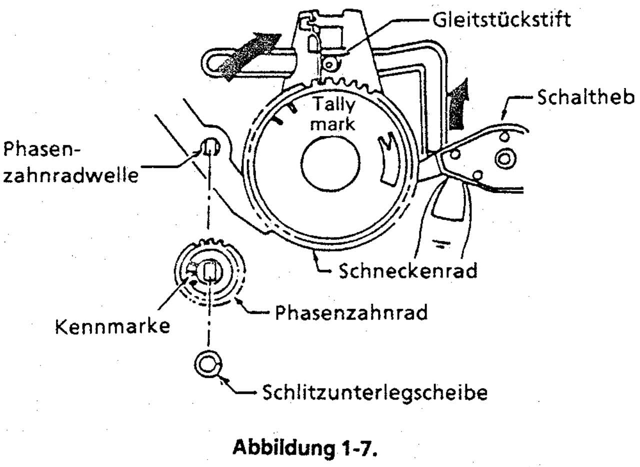

Gleitstückstift
Schaltheb
Tally mark
Phasen-zahnradwelle
Schneckenrad
Phasenzahnrad
Kennmarke
Schlitzunterlegscheibe

Abbildung 1-7.

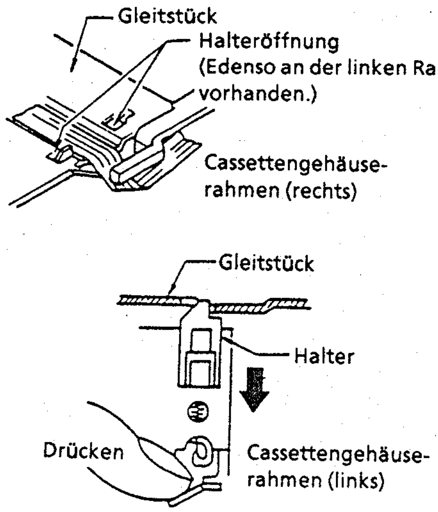
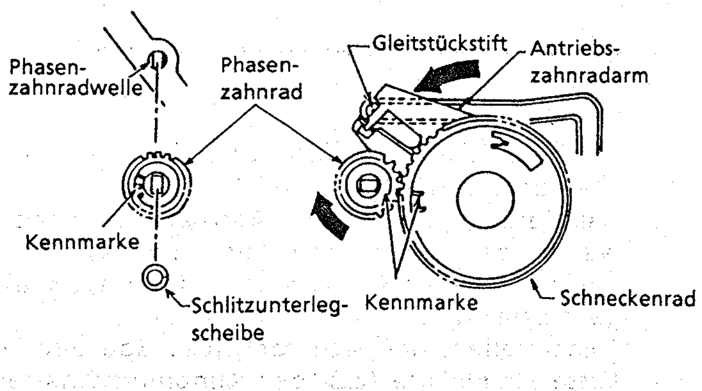

Gleitstück
Halteröffnung
(Edenso an der linken Rahmenseite vorhanden.)
Cassettengehäuse-rahmen (rechts)
Gleitstück
Halter
Drücken
Cassettengehäuse-rahmen (links)

Abbildung 1-8.

- **Einbau**

1. Das Phasenzahnrad solange im Uhrzeigersinn drehen, bis das Gleitstück in der Cassetten - Einführungsrichtung zum Stillstand kommt (siehe Abbildung 1-9).
2. Die vorbereitete Schneckenradeinheit in den rechten Cassettengehäuserahmen einsetzen und dabei die Marke am Phasenzahnrad mit der Marke am Schneckenrad ausrichten. Um einen problemlosen Einbau der Schneckenradeinheit zu gewährleisten, ist die Schlitzunterlegscheibe an der Phasenzahnradeinheit und am Phasenzahnrad zu entfernen.
   Hinweis:
   Sicherstellen, daß sich der Gleitstückstift in der Nut des Antriebsradarms befindet.


Phasen-zahnradwelle
Phasen-zahnrad
Gleitstückstift
Antriebs-zahnradarm
Kennmarke
Schlitzunterleg-scheibe
Kennmarke
Schneckenrad

(a) (b)

Abbildung 1-9.

3. Die Riemenscheibe und den Cassetten - Laderiemen am Schneckenrad anbringen. Die Kupplung am Kupplungshebel befestigen. Danach die Teile zusammen in den rechten Cassettengehäuserahmen einbauen.

Hinweis:
Immer darauf achten, daß der Kupplungsschalterhebel stets in der korrekten Position sitzt. Das Bandlaufwerk kann Störungen aufweisen, wenn der Hebel auch nur leicht von der Ein-bauposition abweicht (siehe Seite 74).

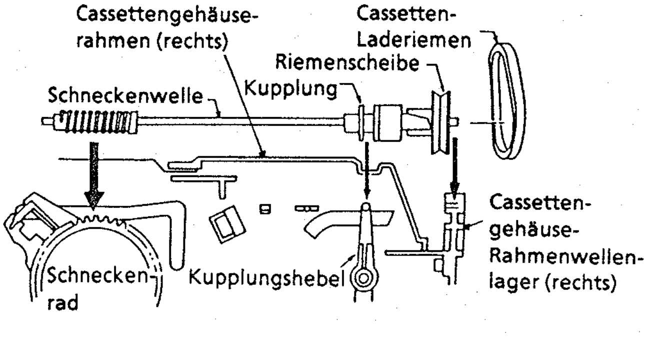

Cassettengehäuse-rahmen (rechts)
Cassetten-Laderiemen
Riemenscheibe
Schneckenwelle
Kupplung
Cassetten-gehäuse-Rahmenwellen-lager (rechts)
Schnecken-rad
Kupplungshebel

Abbildung 1-10.

4. Den Schneckenradhalter an der Schneckenwelle anbringen. Diese Einheit nun auf der Nabe des rechten Cassettengehäuseramens anbringen.
   Hinweis:
   Zuerst ① einführen und dann ② und ③ einschrauben.

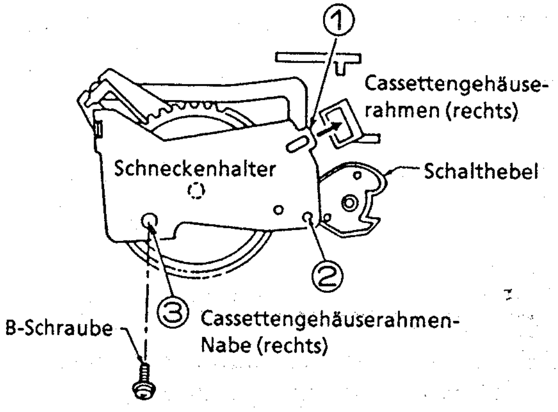
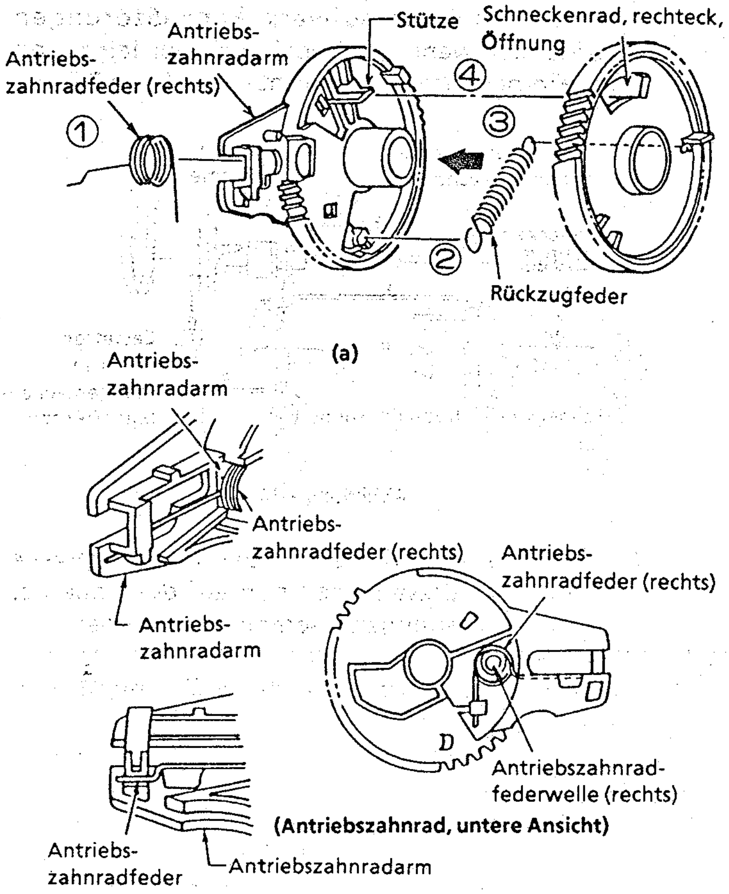

①
Cassettengehäuse-rahmen (rechts)
Schneckenhalter
Schalthebel
②
B-Schraube
③
Cassettengehäuserahmen-Nabe (rechts)

Abbildung 1-11.

5. Die B-Schraube festziehen.
   Hinweis:
   Die B-Schraube nicht übermäßig festziehen (nicht mehr als 5,0 ± 0,5 kg·cm), da sonst die unteren Gewindegänge im Schraubenloch der Kunstharznabe ausreißen können.
6. Die Startsensor - Leiterplatte am rechten Cassettengehäuserahmen anbringen.
   Hinweis:
   Sicherstellen, daß sich die Schalteranshlüsse (Nr. 16, 17) im Cassettenschalter - Montageloch befinden.
7. Schließlich den Cassetten - Schalteranschluß wieder an die Startsensor - Leiterplatte anlöten.

EINBAU DES ANTRIEBSZAHNRADS


Antriebs-
zahnradarm
Antriebs-
zahnradfeder (rechts)
①
Stütze
Schneckenrad, rechteck, Öffnung
④
③
②
Rückzugfeder
(a)
Antriebs-
zahnradarm
Antriebs-
zahnradfeder (rechts)
Antriebs-
zahnradarm
Antriebs-
zahnradfeder (rechts)
D
Antriebszahnrad-
federwelle (rechts)
(Antriebszahnrad, untere Ansicht)
Antriebs-
zahnradfeder
Antriebszahnradarm

(b)

Abbildung 1-12.

1. Die Spitze der Antriebszahnradfeder (rechts) ① durch die quadratische Öffnung des Antriebszahnrads (rechts) führen, um die Feder in ihrer Einbauposition einzuhaken.
2. Ein Ende ②der Rückzugfeder in die Raste des rechten Antriebszahnrads einhaken.
3. Das andere Ende ③ der Rückzugfeder in die Raste des Schneckenrads einhaken.
4. Die Welle ④ des rechten Antriebszahnrads in die quadratische Öffung des Schneckenrads eiführen. Für die Einführung des Schneckenrads zum rechten Antriebszahnrad das Schneckenrad leicht gegen den Uhrzeigersinn drehen, da die Rückzugfederkraft einwirkt.

AUSWECHSELN DES CASSETTEN - LADERIEMENS

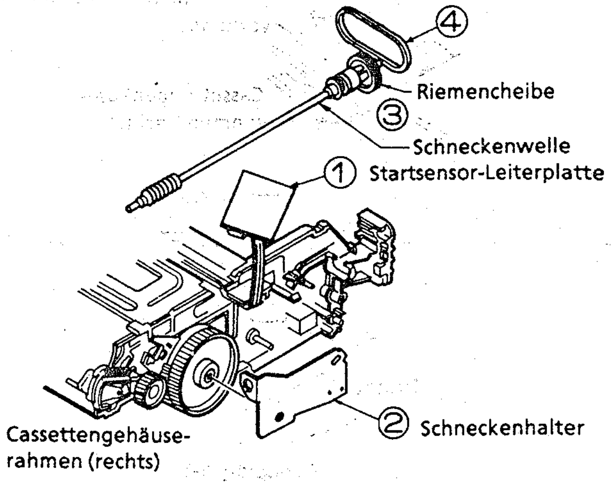

④
Riemencheibe
③
Schneckenwelle
①
Startsensor-Leiterplatte
Cassettengehäuse-
rahmen (rechts)
②
Schneckenhalter

Abbildung 1-13.

1. Die Startsensor - Leiterplatte ① und die Schneckenradhalterung ② vom rechten Cassettengehäuserahmen entfernen.
2. Die Schneckenwelle ③entfernen.
3. Den Cassetten - Laderiemen ④ gegen einen neuen austauschen.

Hinweise:

1. Die B-Schraube, welche die Schneckenradhalterung in Position hält, nicht übermäßig festziehen. Das vorgeschriebene Anzugsmoment beträgt 5,0 ± 0,5 kg. cm.
2. Sicherstellen, daß sich kein Fett am Cassetten-Laderiemen befindet. Falls dennoch Fett festgestellt wird, den Riemen gründlich mit Reinigungslösung säubern.
3. Den Kupplungsschalterhebel auf richtige Funktion überprüfen.

ÜBERPRÜFUNG DES KUPPLUNGSSCHALTERHEBELS

- **Überprüfung**

Das Gerät in die Auswurf-Betriebsart bringen, wenn das Cassettengehäuse an das Bandlaufwerkchassis angebracht oder davon abgenommen wird.

Sicherstellen, daß sich sämtliche Bauteile im Cassettengehäuse (z.B. der Kupplungsschalterhebel) in der korektion Position befinden; andernfalls kann es zu Störungen kommen.

Hinweis:

Die Abbildung 1-14 zeigt die Position jedes einzelnen Teils in der Auswurf - Betriebsart.

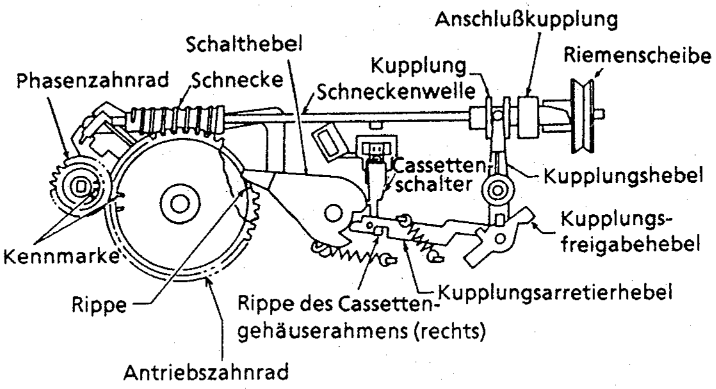
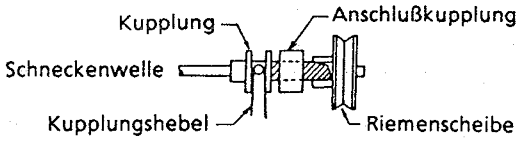

Anschlußkupplung
Schalthebel
Kupplung
Riemenscheibe
Phasenzahnrad
Schnecke
Schneckenwelle
Cassetten-schalter
Kupplungshebel
Kupplungs-freigabehebel
Kennmarke
Rippe
Rippe des Cassetten-gehäuserahmens (rechts)
Kupplungsarretierhebel
Antriebszahnrad

Abbildung 1-14.

1. Zuerst sicherstellen, daß die Spitze des Schalthebels an die Rippe des rechten Antriebszahnrads gehalten wird.
2. Überprüfen, daß die Rippe des rechten Cassettengehäuserahmens und die Austiefung des Kupplungsarretierhebels ineinander einrasten.
3. Zum Abschluß sicherstellen, daß das Verhältnis zwischen Kupplungshebel und Kupplung sowie zwischen Kupplung und Riemenscheibe wie in Abbildung 1-15 übereinstimmt.


Kupplung
Anschlußkupplung
Schneckenwelle
Kupplungshebel
Riemenscheibe

Sicherstellen, daß die Kupplung durch die Anschlußkupplung in die Riemenscheibe eingreift.

Abbildung 1-15.

- **Einstellen**

Folgende Schritte zur Einstellung der Kupplung durchführen, wenn die Arretierung aufgehoben ist, oder wenn der Schalthebel und der Kupplungs - Arretierhebel ausgerastet sind.

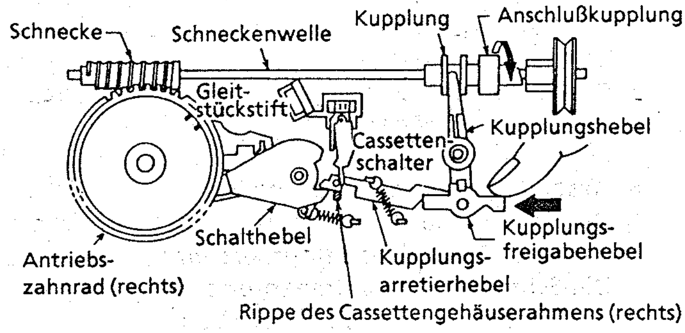

Schnecke
Schneckenwelle
Kupplung
Anschlußkupplung
Gleit-stückstift
Cassetten-schalter
Kupplungshebel
Schalthebel
Kupplungs-freigabehebel
Antriebs-zahnrad (rechts)
Kupplungs-arretierhebel
Rippe des Cassettengehäuserahmens (rechts)

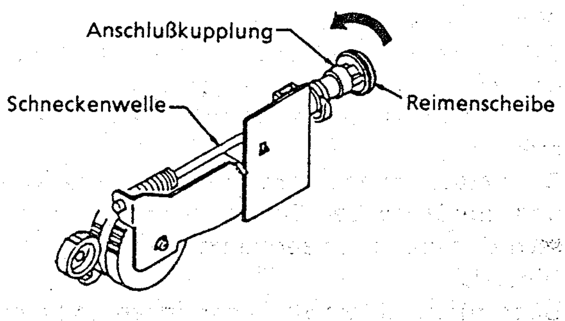
Abbildung 1-16.

1. Das Gleitstück durch Drehen der Anschlußkupplung in Pfeilrichtung (gegen den Uhrzeigersinn) verschieben, bis sich der Gleitstückstift an der Unterseite der Gleitstücknut (Abbildung 1-16) befindet (Lade - Betriebsart).
   Hinweis:
   Das Gleitstück ist mit einem Arretiermechanismus versehen. Die Arretierungen links und rechts am Cassettengehäuserahmen aufheben, bevor das Gleitstück verschoben wird.
2. Wenn die Position wie in Abbildung 1-16 vorliegt, den Kupplungsfreigabehebel von Hand in Pfeilrichtung drücken, bis der Kupplungsarretierhebel durch die Rippe am rechten Cassettengehäuserahmen fest arretiert wird.
3. Danach die Anschlußkupplung gegen den Uhrzeigersinn drehen, bis das Gleitstück den Cassetten - Einführungsschlitz erreicht und die Rückzugfeder aktiviert ist.
   Hinweis:
   Es besteht kein Grund die Gleitstückarretierung aufzuheben, wenn das Gleitstück zum Cassetten-Einführungsschlitz geschoben wird. Einfach mit dem Verschieben des Gleitstücks fortfahren.

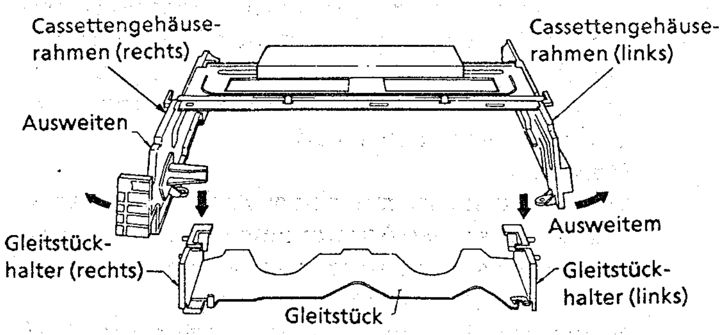
AUSWECHSELN DES ARRETIER - FREIGABEHEBELS

- **Ausbau**

1. Das Gleitstück in die "Cassette nach unten" - Position bringen. (Die Anschlußkupplung an der Schneckenwelle im Uhrzeigersinn drehen, bis sich das Gleitstück in der "Cassette nach unten" - Position befindet.)
   Hinweis:
   Vor dem Verschieben die Gleitstückarretierung aufheben.
2. Den linken und rechten Cassettengehäuserahmen leicht ausweiten, um die Gleitstückhalter (rechts und links) aus den Nuten des Cassettengehäuserahmens auszuhaken.


Anschlußkupplung
Schneckenwelle
Riemenscheibe

(a)


Cassettengehäuse-rahmen (rechts)
Cassettengehäuse-rahmen (links)
Ausweiten
Ausweitem
Gleitstück-halter (rechts)
Gleitstück-halter (links)
Gleitstück

(b)

Abbildung 1-17.

3. Den rechten Gleitstückhalter ca. 2mm vom Gleitstück anheben, indem die beiden Sperrhaken mit einem dünnen Schraubendreher hineingedrückt werden. Vorsicht, damit die Sperrhaken nicht beschädigt werden.

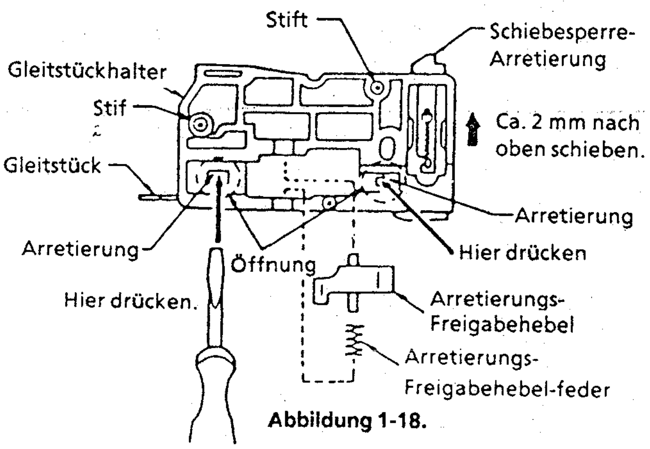

Stift
Schiebesperre-Arretierung
Gleitstückhalter
Stif
Ca. 2 mm nach oben schieben.
Gleitstück
Arretierung
Arretierung
Hier drücken
Öffnung
Hier drücken.
Arretierungs-Freigabehebel
Arretierungs-Freigabehebel-feder

Abbildung 1-18.

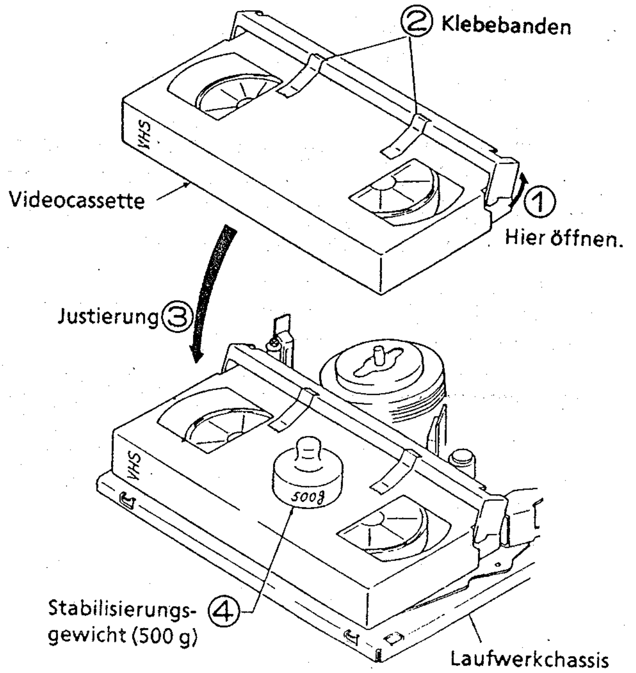
4. Den Arretier - Freigabehebel vom rechten Gleitstückhalter entfernen.

- Einbau

1. Den Ausbauschritten in umgekehrter Reihenfolge folgen (siehe Abbildungen 1-17 und 1-18).
2. Den Arretier - Freigabehebel an den rechten Gleitstückhalter anbringen.
3. Den rechten Gleitstückhalter nach unten drücken, so daß die beiden Sperrhaken des Halters in die Gleitstückhalteröffnungen einrasten.
4. Die Cassettengehäuserahmen leicht aufweiten und die Stifte der Gleitstückhalter (links und rechts) in die Nuten der Rahmen einsetzen.
   Hinweis:
   Überprüfen, ob die Stifte der linken und rechten Gleitstückhalter in den Nuten der Cassettengehäuserahmen sitzen und der Antriebszahnradarm richtig in die Gleitstückhalter eingreift.
5. Die Anschlußkupplung gegen den Uhrzeigersinn drehen, bis das Gleitstück den Cassetten - Einführungsschlitz erreicht.

BEI BANDLAUF OHNE CASSETTENGEHÄUSE

1. Das Netzkabel anschließen.
2. Das Gerät einschalten.
3. Den Cassettendeckel ①von Hand öffnen.
4. Den Deckel mit zwei klebestreifen ② fixieren.
5. Die Cassette in das Bandlaufwerk einsetzen.
6. Die Cassette mit einem Gewicht ④ stabilisieren.
7. Danach einen Testlauf durchführen.


② Klebebanden
VHS
Videocassette
①
Hier öffnen.
Justierung③
500g
Stabilisierungs-gewicht (500 g) ④
Laufwerkchassis

Hinweis:
Das Gewicht sollte nicht schwerer als 500 g sein.

Abbildung 1-19.

AUSWECHSELN UND HOHENEINSTELLUNG SOWIE EINSTELLUNG DER SPULENSCHEIBEN

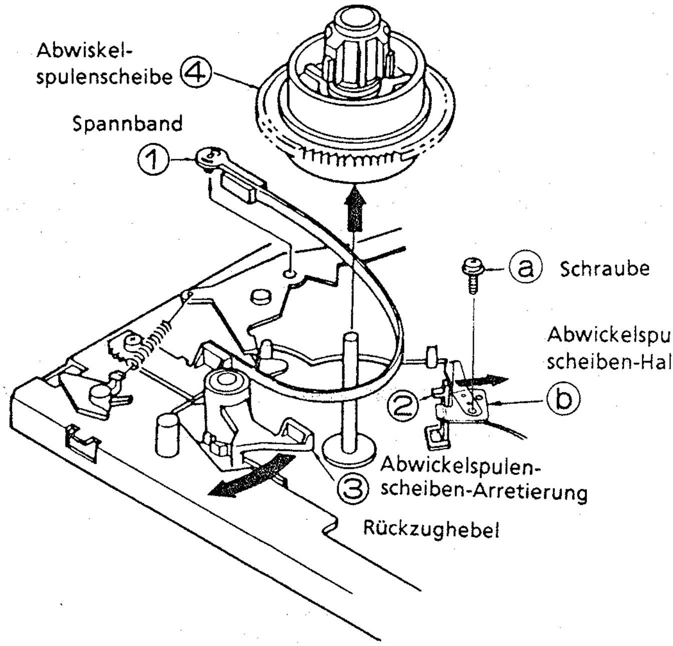
1. Das Cassettengehäuse ausbauen.
2. Das Bandlaufwerk ohne eingelegte Cassetten in die Wiedergabe - Betriebsart bringen. Das Netzkabel abziehen.
3 Das Zwischenrad in die Mittelposition (Neutralstellung) bringen.

- Ausbau (Abwickelspulenscheibe)

1. Das Spannband ① entfernen. (Vorsicht, damit das Spannband nicht deformiert wird.)
2. Die Schraube ⓐ losdrehen und den Halter der Abwickelspulenscheibe ⓑ aubauen.
3. Die Sperre der Abwickelspulenscheibe ② und den Rückzugshebel ③ freigeben.
4. Die Abwickelspulenscheibe nach oben ziehen.

Hinweise:

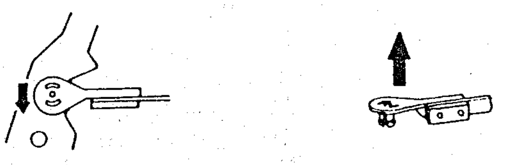
1. Vorsicht, damit das Spannband nicht deformiert wird.
2. Die Position des Spannstabs überprüfen und einstellen (siehe Seite 82).
3. Vorsicht, damit das Zahnrad und das Zwischenrad der Abwickelspulenscheibe nicht beschädigt werden.
4. Das Spannband für den Ausbau in Pfeilrichtung drücken. (siehe Abbildung 1-20(b))


Abwiskel-
spulenscheibe ④
Spannband
①
ⓐ Schraube
Abwickelspulen-
scheiben-Halter
②
ⓑ
Abwickelspulen-
③ scheiben-Arretierung
Rückzughebel

(a)

Hinweis:

Wenn das Spannband zum Ausbau in Pfeilrichtung gedrückt wird, ist ein größerer Kraftaufwand zum Lösen der Arretierung erforderlich.



(b)

Abbildung 1-20.

- **Ausbau (Aufwickelspulenscheibe)**

1. Die Schraube ⓒ losdrehen und den Halter der Aufwickelspulenscheibe entfernen.
2. Die Sperre ① der Aufwickelspulenscheibe freigeben.
3. Die Aufwickelspulenscheibe ② nach oben ziehen.

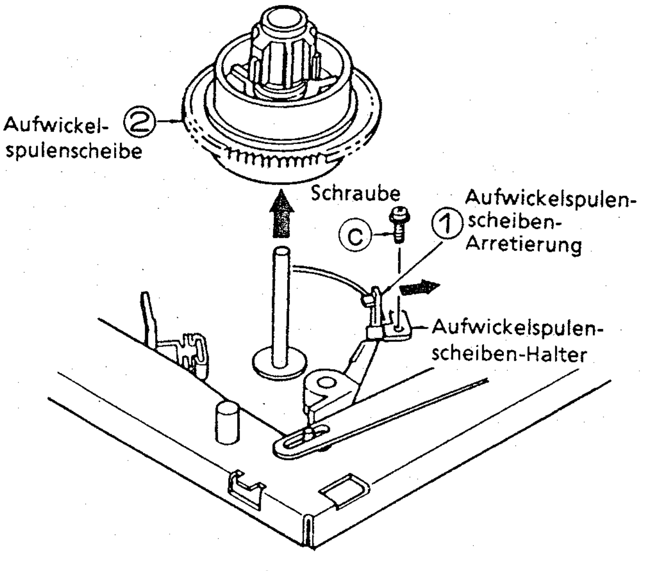

Aufwickel- ②
spulenscheibe
Schraube
ⓒ
Aufwickelspulen-
① scheiben-
Arretierung
Aufwickelspulen-
scheiben-Halter

Abbildung 1-21.

- **Einbau (Abwickelspulenscheibe)**

1. Die Spulenscheibenwelle reinigen und einölen.
2. Die Spulenscheibensperre ② der Abwickelspulenscheibe sowie den Rückzughebel ③ freigeben.
3. Eine neue Abwickelspulenscheibe ④ auf die Welle schieben.
4. Das Spannband ⑤an der Abwickelspulenscheibe auswechseln und es in die Öffnung des Spannarms einführen.
5. Den Halter ⓑ der Abwickelspulenscheibe auswechseln und die Schraube ⓐ festziehen.

Hinweise:

1. Vorsicht, damit das Spannband während des Einbaus der Abwickelspulenscheibe nicht deformiert wird.
2. Darauf achten, daß das Abwickelspulenscheiben - Zahnrad, der Rückzughebel, die Sperre der Abwickelspulenscheibe und andere Bauteile nicht mit Werkzeugen beschädigt werden.

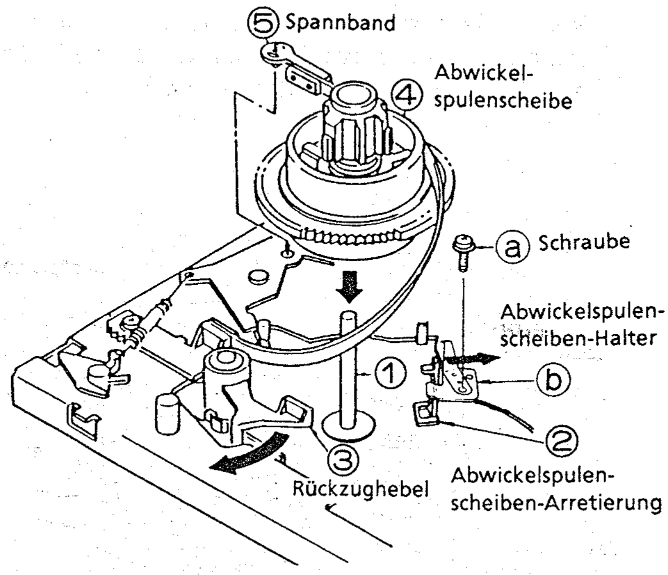
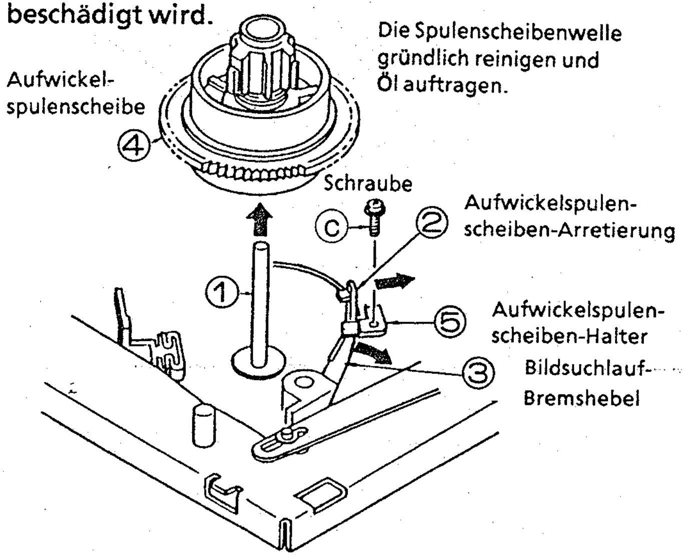

⑤ Spannband
Abwickel-
④ spulenscheibe
ⓐ Schraube
Abwickelspulen-
scheiben-Halter
①
ⓑ
②
③
Rückzughebel
Abwickelspulen-
scheiben-Arretierung

Abbildung 1-22.

- **Einbau (Aufwickelspulenscheibe)**

1. Die Spulenscheibenwelle ① reinigen und einölen.
2. Die Spulenscheibensperre ② der Aufwickelspulenscheibe sowie den Bildsuchlauf-Bremshebel ③ freigeben.
3. Eine neue Aufwickelspulenscheiben-Sperre ④ auf die Welle schieben.
4. Den Halter ⑤ der Aufwickelspulenscheibe auswechseln und die Schraube ⓒ festziehen.

Hinweis:
Vorsicht, damit der Bildsuchlauf - Bremshebel nicht beschädigt wird.


Aufwickel-spulenscheibe
④
Die Spulenscheibenwelle gründlich reinigen und Öl auftragen.
Schraube
ⓒ
②
Aufwickelspulen-scheiben-Arretierung
①
⑤
Aufwickelspulen-scheiben-Halter
③
Bildsuchlauf-Bremshebel

Einen dünnen Schraubendreher in Pfeilrichtung anwenden, um einen leichteren Einbau der Aufwickelspulenscheibe zu gewährleisten.

Abbildung 1-23.

* Nach dem Einbau die Rückzugskraft des Rückwärts-Bildsuchlaufs (siehe Seite 81) sowie das Bremsdrehmoment (siehe Seite 84).

- **Überpuüfung und Einstellung der Höhe**

Hinweis:
Die Hauptebene auf dem Laufwerk anbringen und dabei achtgeben, daß sie nicht an die Trommel schlägt (siehe Abbildung 1-24).

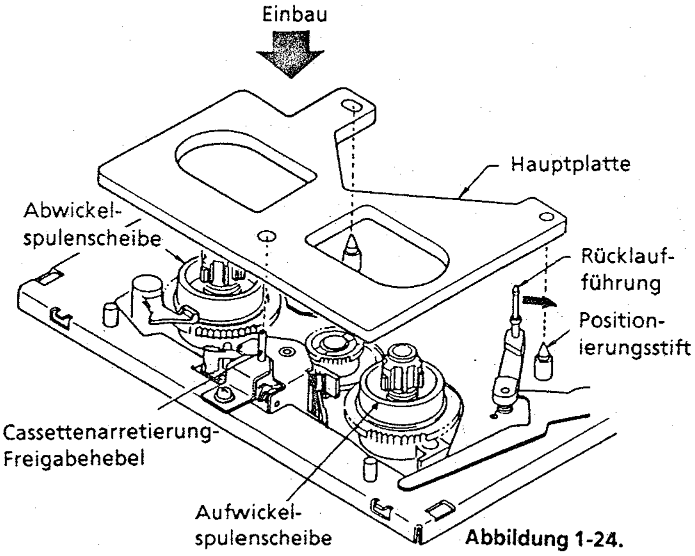

Einbau
Hauptplatte
Abwickel-spulenscheibe
Rücklauf-führung
Position-ierungsstift
Cassettenarretierung-Freigabehebel
Aufwickel-spulenscheibe

Abbildung 1-24.

1. Zur Einstellung der Höhe ist die Spulenscheibe mit einem Finger niederzudrücken und dann mit einem Schraubendreher nach rechts oder links zu drehen (siehe Abbildung 1-26 (a)).

Die Hauptplatte durch Loslassen der Rücklaufführung mit einem Finger positionieren.

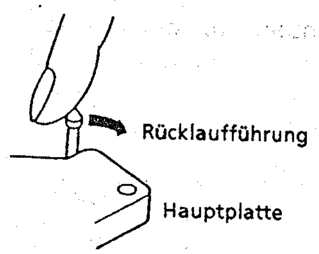
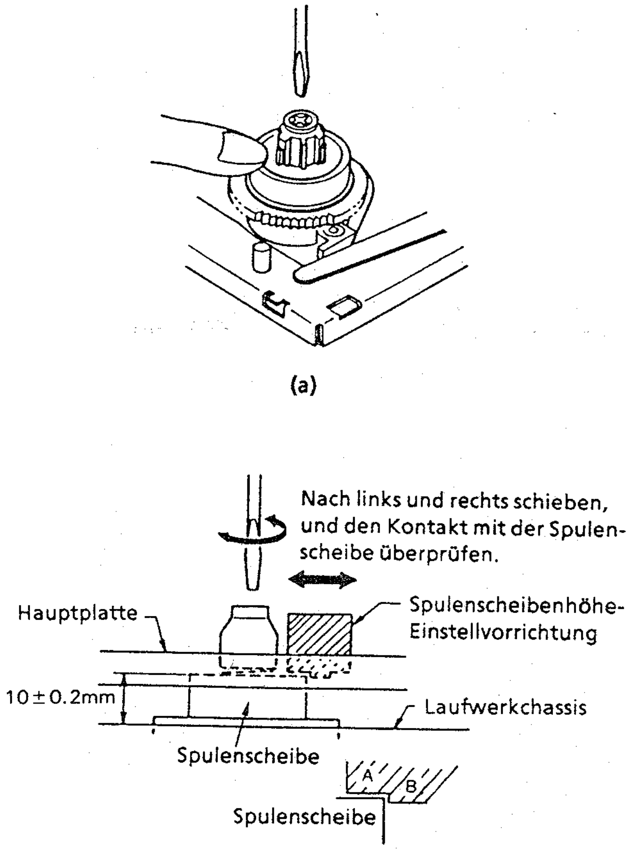

Rücklaufführung
Hauptplatte

Abbildung 1-25.

2. Sicherstellen, daß die Spulenscheibe tiefer als der Teil A, jedoch höher als der Teil B positioniert ist. Wenn die Höhe nicht korrekt ist, diese mit der Höheneinstellschraube justieren (siehe Abbildung 1-26 (b)).

Hinweis:
Bei jedem Auswechseln der Spulenscheibe muß die Überprüfung der Höhe sowie ihre Einstellung vorgenommen werden.


(a)
Nach links und rechts schieben, und den Kontakt mit der Spulenscheibe überprüfen.
Hauptplatte
Spulenscheibenhöhe-Einstellvorrichtung
10±0.2mm
Laufwerkchassis
Spulenscheibe
A
B
Spulenscheibe

(b)

Abbildung 1-26.

ÜBERPRÜFUNG UND EINSTELLUNG DES AUFWICKELDREHMOMENTS IN DER SCHNELLVORLAUF - BETRIEBSART

- **Das Cassettengehäuse entfernen.**

- **Vorbereitung**

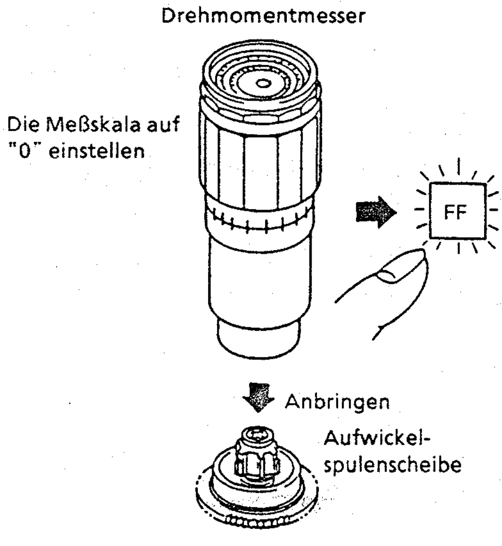

Drehmomentmesser
Die Meßskala auf "0" einstellen
FF
Anbringen
Aufwickel-spulenscheibe

Abbildung 1-27.

- **Überprüfung**

Den Drehmomentmesser langsam von Hand in die Aufwickelrichtung drehen (eine Drehung alle 2 bis 3 Sekunden).

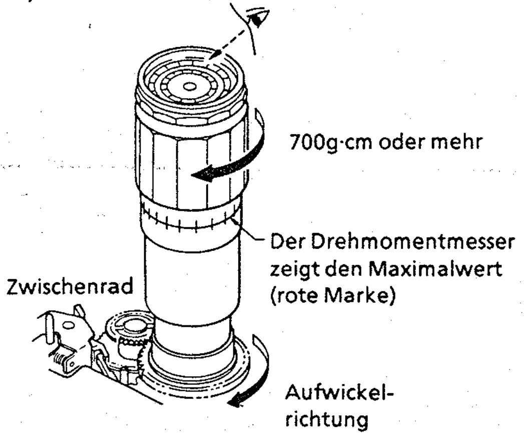

700g·cm oder mehr
Der Drehmomentmesser zeigt den Maximalwert (rote Marke)
Zwischenrad
Aufwickel-richtung

Abbildung 1-28.

- **Einstellung**

1. Wenn das Aufwickeldrehmcment außerhalb des Sollwerts liegt, die Riemenscheibe des Antriebsachsen- Direktantriebsmotors, die Spulenscheiben -Riemenscheibe mit Reinigungsflüssigkeit säubern. Danach das Drehmoment erneut überprüfen.
2. Wenn das Aufwickeldrehmoment immer noch nicht dem Sollwert entspricht, muß der Spulenriemen erneuert werden.

Hinweise:

1. Den Drehmomentmesser hinunterdrücken, damit er nicht weggeschleudert wird.
2. Beim Überprüfen des Aufwickeldrehmoments die Spulenscheibe nicht für längere Zeit blockiert halten.

ÜBERPRÜFUNG UND EINSTELLUNG DES AUFWICKELDREHMOMENTS IN DER RÜCKSPUL - BETRIEBSART

- **Das Cassettengehäuse entfernen.**

- **Vorbereitung**

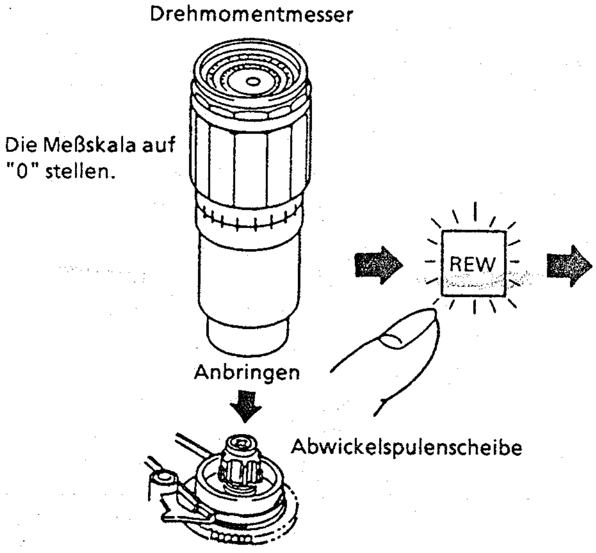

Drehmomentmesser
Die Meßskala auf "0" stellen.
REW
Anbringen
Abwickelspulenscheibe

Abbildung 1-29.

- **Überprüfung**

Den Drehmomentmesser langsam von Hand in die Aufwickelrichtung drehen (eine Drehung alle 2 bis 3 Sekunden)

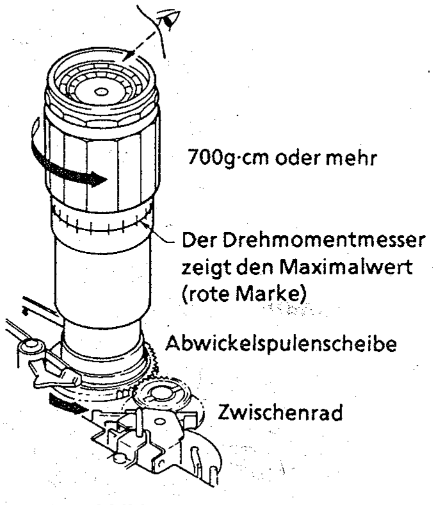

700g·cm oder mehr
Der Drehmomentmesser zeigt den Maximalwert (rote Marke)
Abwickelspulenscheibe
Zwischenrad

Abbildung 1-30.

- **Einstellung**

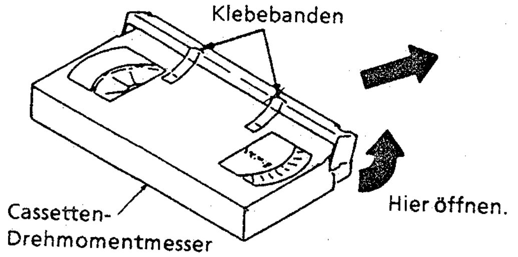
1. Wenn das Aufwickeldrehmoment außerhalb des Sollwerts liegt, die Riemenscheibe des Antriebsachsen - Direktantriebsmotors, die Spulenscheiben - Riemenscheibe mit Reinigungsflüssigkeit säubern. Danach das Drehmoment erneut überprüfen.
2. Wenn das Aufwickeldrehmoment immer noch nicht dem Sollwert entspricht, muß der Spulenriemen erneuert werden.

Hinweise:

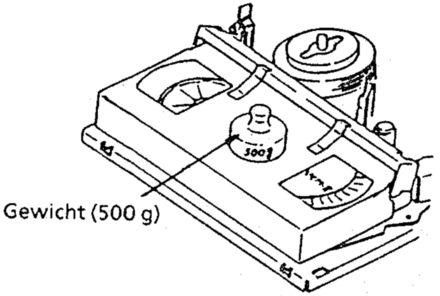
1. Den Drehmomentmesser hinunterdrücken, damit er nicht weggeschleudert wird.
2. Beim Überprüfen des Aufwickeldrehmoments die Spulensocheibe nicht für längere zeit blockiert halten.

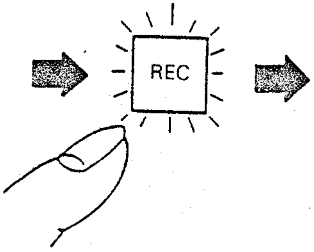
ÜBERPRÜFUNG UND EINSTELLUNG DES AUFWICKELDREHMOMENTS IN DER WIEDERGABE - BETRIEBSART

1. Das Cassettengehäuse entfernen.
2. Den Deckel der Drehmomentmessercassette öffnen und mit zwei klebestreifen befestigen.



Die Drehmoment-Meßcassette in das Gerät einsetzen.





LP-Einstellwert 95 ± 30 g·cm

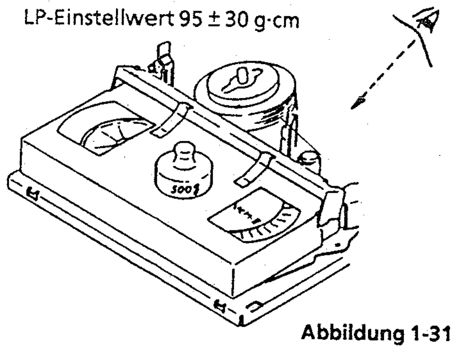


Abbildung 1-31.

- **Überprüfung**

1. Sicherstellen, daß das Drehmoment im Bereich von 95 ± 30 g·cm liegt.
2. Das Drehmoment schwankt auf Grund der Rotationsabweichung des Spulenscheibenantriebs. Den Abweichungsmittelwert zugrundelegen.
3. Das Gerät in die LP - Aufnahme - Betriebsart bringen und sicherstellen, daß sich das Aufwickeldrehmoment innerhalb des Sollwerts befindet.

- **Einstellung**

Wenn das Aufwickeldrehmoment außerhalb des Sollwerts liegt, muß die Aufwickelspulenscheibe erneuert werden.

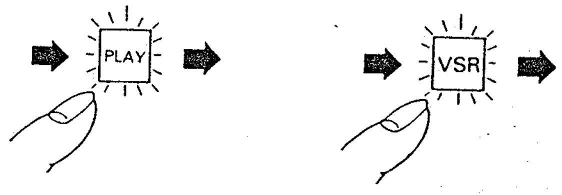
Hinweis:

Den Cassetten - Drehmomentmesser mit einem Gewicht belasten, um ihn zu stabilisieren.

ÜBERPRÜFUNG UND EINSTELLUNG DES AUFWICKEL-DREHMOMENTS IM RÜCKWÄRTS-BILDSUCHLAUF-MODUS

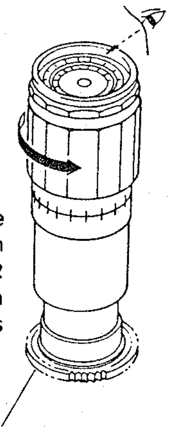
- **Das Cassettengehäuse entfernen.**

- **Überprüfung**



Die Wiedergabetaste drücken, um das Gerät in die Wiedergabe funktion zu bringen.

Die Rückwärts-Bildsuchlauftaste drücken, um das Gerät in die Rückwärts-Suchlauffunktion zu bringen.



Den Drehmomentmesser bündig auf die abwickelspule setzen und ihn langsam gegen den Uhrzeigersinn drehen (eine Umderhung in 2 bis 3 Sekunden). Danach überprüfen, daß sich das Drehmoment innerhalb des Vorgabewerts von 170 ± 40 g·cm befindet.

Abbildung 1-32.

Hinweis:

Den Drehmomentmesser bündig auf die Abwickelspulenscheibe setzen; andernfalls werden falsche Meßergebnisse angezeigt.

- **Einstellung**

Wenn das Aufwickelspulen-Drehmoment bei der Rückwärts-Bildsuchlauffunktion außerhalb des Sollwerts liegt, ist die Abwickelspulenscheibe auszuwechseln.

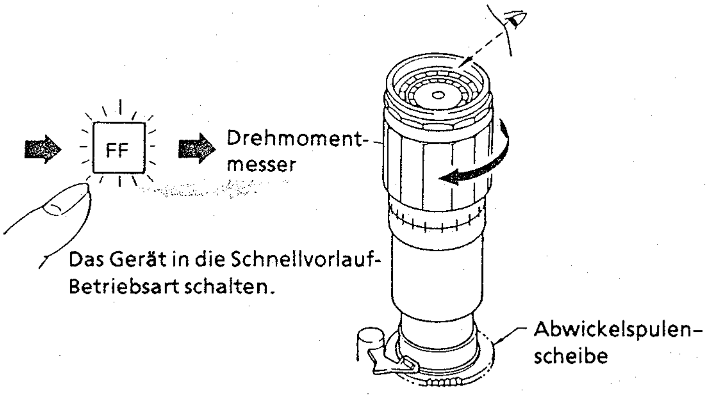
Hinweis:

Das Drehmoment schwankt wegen der Drehabweichung der Abwickelspulenscheibe. Für die Ermittlung des Werts ist der Mittelwert anzunehmen.

ÜBERPRÜFUNG DES RÜCKZUGS IN DER SCHNELLVORLAUF - BETRIEBSART

- **Das Cassettengehäuse entfernen.**

- **Überprüfung**



Das Gerät in die Schnellvorlauf-Betriebsart schalten.

Den Drehmomentmesser an der Abwickelspulenscheibe anbringen und ganz langsam im Uhrzergersinn drehen (eine Drehung alle 2 bis 3 Sekunden). Das drehmoment muß sich im Bereich von 15 ±5 g·cm befinden.

Abbildung 1-33.

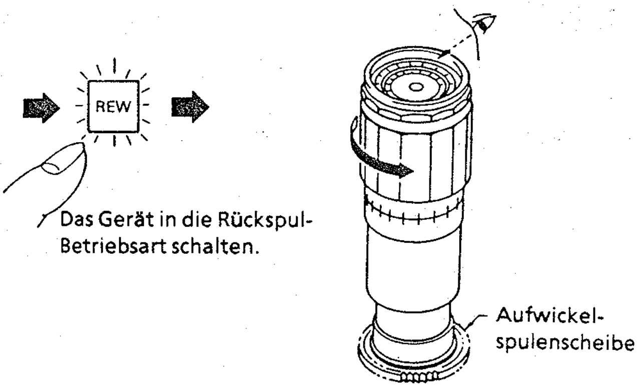
Hinweis:

Den Drehmomentmesser vorsichtig auf die Abwickelspulenscheibe setzen. Wenn der Drehmoment- messer nicht korrekt auf die Abwickelspulenscheibe gesetzt wird, werden falsche Meßergebnisse angezeigt.

ÜBERPRÜFUNG DES RÜCKZUGS DER RÜCKSPUL - BETRIEBSART

- **Das Cassettengehäuse entfernen.**

- **Überprüfung**



Das Gerät in die Rückspul-Betriebsart schalten.

Den Drehmomentmesser an der Aufwickelspulenscheibe anbringen und ganz langsam gegen den Uhreigersinn drehen (eine drehung alle 2 bis 3 Sekunden). Das Drehmoment muß sich im Bereich von 15 ± 5g·cm befinden.

Abbildung 1-34.

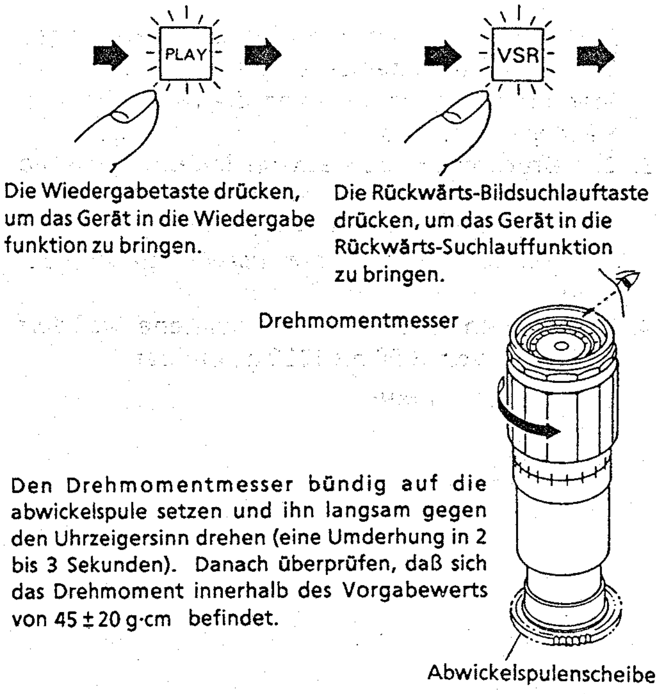
Hinweis:

Den Drehmomentmesser vorsichtig auf die Aufwickelspulenscheibe setzen. Wenn der Drehmomentmesser nicht korrekt auf die Aufwickelspulenscheibe gesetzt wird, werden falsche Meßergebnisse angezeigt.

ÜBERPRÜFUNG DES RÜCKZUGS IN DER BILDSUCHLAUF-RÜCKSPUL-BETRIEBSART

- **Das Cassettengehäuse entfernen.**

- **Überprüfung**



Die Wiedergabetaste drücken, um das Gerät in die Wiedergabe funktion zu bringen.

Die Rückwärts-Bildsuchlauftaste drücken, um das Gerät in die Rückwärts-Suchlauffunktion zu bringen.

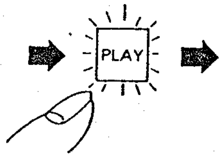
Den Drehmomentmesser bündig auf die abwickelspule setzen und ihn langsam gegen den Uhrzeigersinn drehen (eine Umderhung in 2 bis 3 Sekunden). Danach überprüfen, daß sich das Drehmoment innerhalb des Vorgabewerts von 45±20 g·cm befindet.

Abbildung 1-35.

Hinweis:
Den Drehmomentmesser vorsichtig auf die Aufwickelspulenscheibe setzen. Wenn der Drehmomentmesser nicht korrekt auf die Aufwickelspulenscheibe gesetzt wird, werden falsche Meßergebnisse angezeigt.

ÜBERPRÜFUNG DES ANDRUCKROLLENDRUCKS

- **Das Cassettengehäuse entfernen.**



Die PLAY-Taste drücken, um das Gerät in die Wiedergabe-Betriebsart einzustellen.

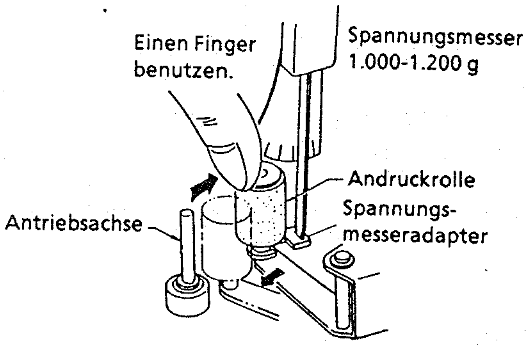

Einen Finger benutzen.
Spannungsmesser 1.000-1.200 g
Andruckrolle
Spannungsmesseradapter
Antriebsachse

Abbildung 1-36.

1. Die Andruckrolle von der Antriebsachse trennen.
2. Den Spannungsmesser einstellen, indem der Spannungsmesseradapter an die Andruckrollenwelle gehängt wird.
3. Den Druck nach und nach verringern, damit die Andruckrolle die Antriebsachse berühren kann. Die Meßanzeige in dem Augenblick ablesen, wo die Andruckrolle die Antriebsachse gerade berührt.
4. Sicherstellen, daß sich der abgelesene Meßwert im Bereich von 1000 bis 1200 g befindet.

ÜBERPRÜFUNG UND EINSTELLUNG DER SPANNSTABPOSITION

- **Das Cassettengehäuse entfernen.**
- **Einstellung**

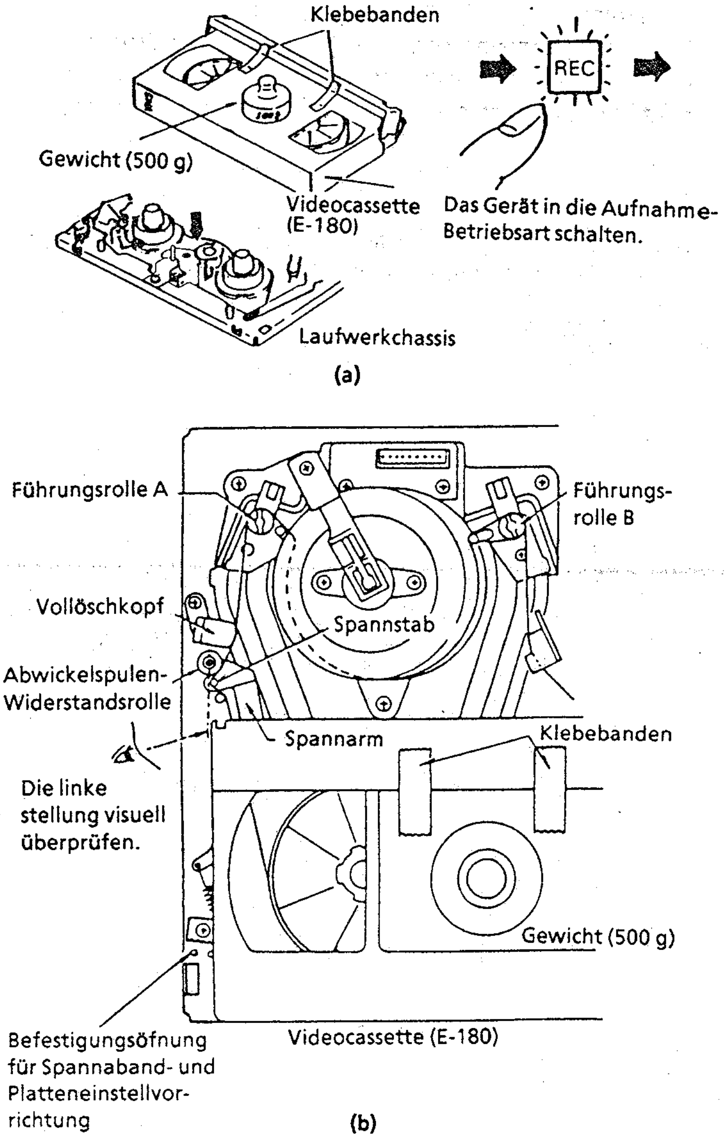

Klebebanden
REC
Gewicht (500 g)
Videocassette (E-180)
Das Gerät in die Aufnahme-Betriebsart schalten.
Laufwerkchassis
(a)
Führungsrolle A
Führungsrolle B
Vollöschkopf
Spannstab
Abwickelspulen-Widerstandsrolle
Spannarm
Klebebanden
Die linke stellung visuell überprüfen.
Gewicht (500 g)
Befestigungsöfnung für Spannaband- und Platteneinstellvorrichtung
Videocassette (E-180)
(b)

Abbildung 1-37.

- **Überprüfung**

1. Die Führungsrollen (A und B) ziehen das Band aus der Cassette heraus, um gleichzeitig bewegt sich der Spannstab zum Laden des Bands nach rechts. Nachdem der Ladevorgang abgeschlossen ist, die Spannstabposition überprüfen.
2. Am Bandanfang (E-180) durch Sichtprobe sicherstellen, daß die Linke des Spannstabs mit der Mitte der Abwickelwiderstandsrolle ausgrichtet ist.
3. Am Bandende sicherstellen, daß das Band weder gegen den Flansch der Abwickelwiderstandsrolle eingerollt ist noch sich darauf defindet.
4. Während der Bildsuchlauf-Rückspul-Betriebsart (keine Cassette eingelegt) überprüfen, ob die Abwickelspulenscheibe frei vom Spannband ist.

- **Einstellung der Spannstabposition (Aufnahme - Betriebsart), wenn sich der Spannstab rechts von der Mitte der Widerstandsrolle befindet.**
  Die Befestigungsschraube lockern und den Halter für die Spannbandeinstellung in Pfeilrichtung drücken. Hierfür ein Spannband und eine Platten-Einstellvorrichtung benutzen, bis der vorgegebene Einstellbereich (Mitte) erreicht ist. Danach die Schraube wieder gut festziehen.

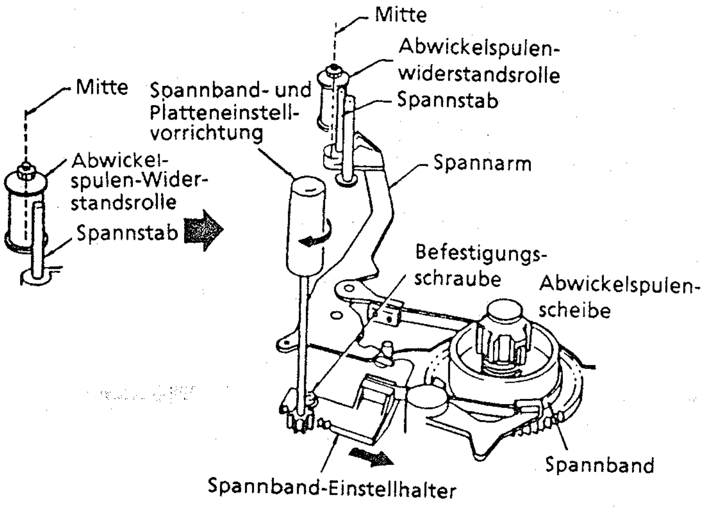

Mitte
Abwickelspulen-widerstandsrolle
Spannstab
Mitte
Spannband- und Platteneinstell-vorrichtung
Abwickel-spulen-Wider-standsrolle
Spannstab
Spannarm
Befestigungs-schraube
Abwickelspulen-scheibe
Spannband
Spannband-Einstellhalter

Abbildung 1-38.

- **Einstellung der Spannstabposition (Aufnahme - Betriebsart), wenn sich der Spannstab rechts von der Mitte der widerstandsrolle befindet.**
  Die Befestigungsschraube lockern und den Halter für die Spannbandeinstellung in Pfeilrichtung drücken. Hierfür ein Spannband und eine Platten-Einstellvorrichtung benutzen, bis der vorgegebene Einstellbereich (Mitte) erreicht ist. Danach die Schraube wieder gut festziehen.

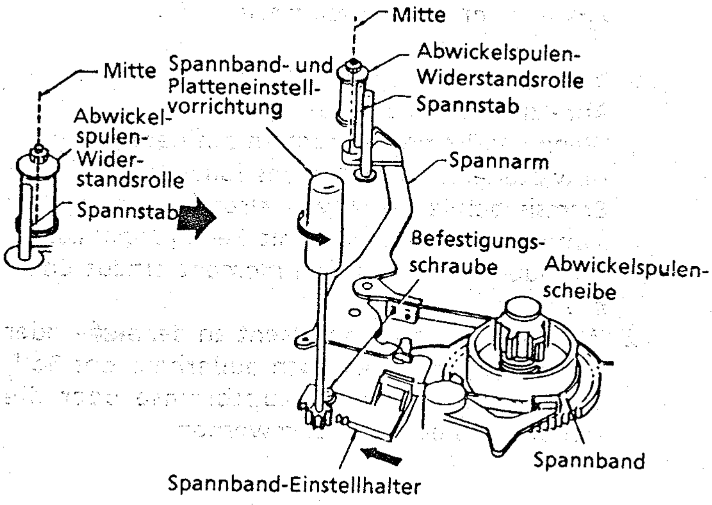

Mitte
Abwickelspulen-Widerstandsrolle
Spannstab
Mitte
Spannband- und Platteneinstell-vorrichtung
Abwickel-spulen-Wider-standsrolle
Spannstab
Spannarm
Befestigungs-schraube
Abwickelspulen-scheibe
Spannband
Spannband-Einstellhalter

Abbildung 1-39.

ÜBERPRÜFUNG UND EINSTELLUNG DES RÜCKZUGS IN DEN AUFZEICHNUNGS - UND WIEDERGABE - BETRIEBSARTEN

- **Das Cassettengehäuse entfernen.**

- **Überprüfung**

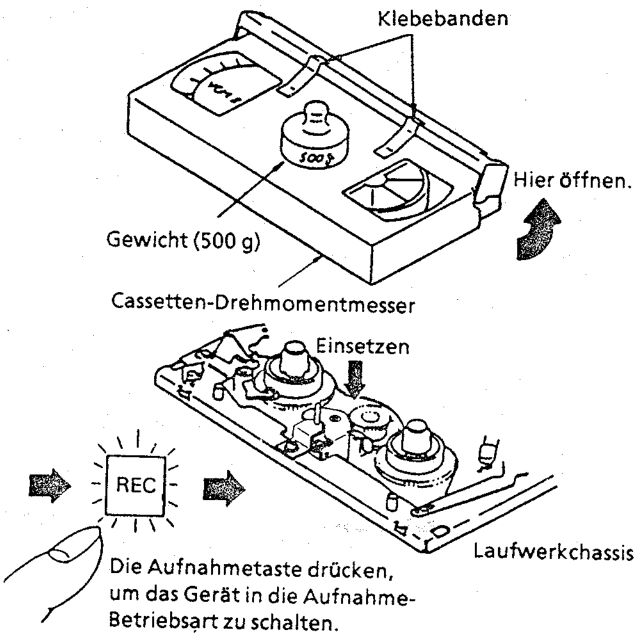

Klebebanden
Hier öffnen.
Gewicht (500 g)
Cassetten-Drehmomentmesser
Einsetzen
REC
Laufwerkchassis
Die Aufnahmetaste drücken, um das Gerät in die Aufnahme-Betriebsart zu schalten.

Abbildung 1-40.

1. Einen Cassetten - Drehmomentmesser in das Gerät einsetzen.
2. Die Aufnahmetaste drücken, um das Gerät in die Aufnahme - Betriebsart zu schalten.
3. Überprüfen, ob sich der abgelesene Wert des Bandrückzugs innerhalb des Bereichs von 31 bis 36 g·cm befindet.

Hinweise:

1. Sicherstellen, daß das Band um die Halteführung gewickelt ist.
2. Sicherstellen, daß das Band nicht lose aufgewickelt oder am Anfang und Ende beschädigt ist.

- **Einstellung**

1. Wenn der abgelesene Wert der Drehmomentcassette unter dem Sollwert liegt, die Spitze der Spannfeder - Einhakplatte gegen das Loch A drücken.
2. Wenn der abgelesene Wert der Drehmomentcassette über dem Sollwert liegt, die Spitze der Spannfeder - Einhakplatte gegen das Loch B drücken.
   Hinweis:
   Einen dünnen Schraubedreher (−) in die Wellenöffnung stecken und zu sich lehnen; dann den Schraubedreher drehen, um eine leichtere Annäherung der Spannfeder - Einhakplatte in Richtung A oder B zu bewirken.

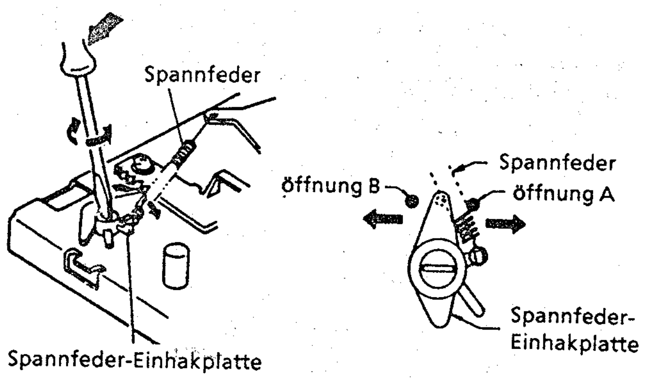
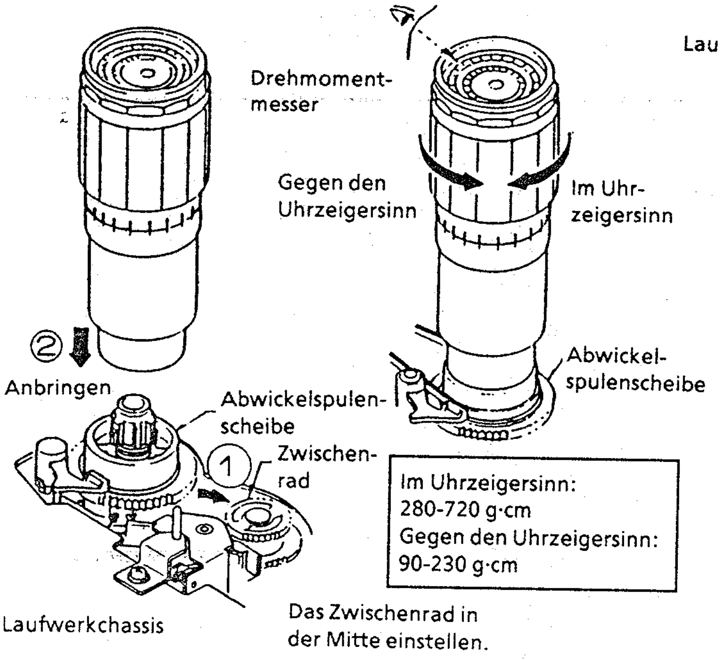

Spannfeder
Spannfeder-Einhakplatte
Öffnung B
Spannfeder
Öffnung A
Spannfeder-Einhakplatte

Abbildung 1-41.

ÜBERPRÜFUNG DES SPULENBREMSDREHMOMENTS

● Überprüfung des Bremsdrehmoments an der Ab-wickelspulenseite

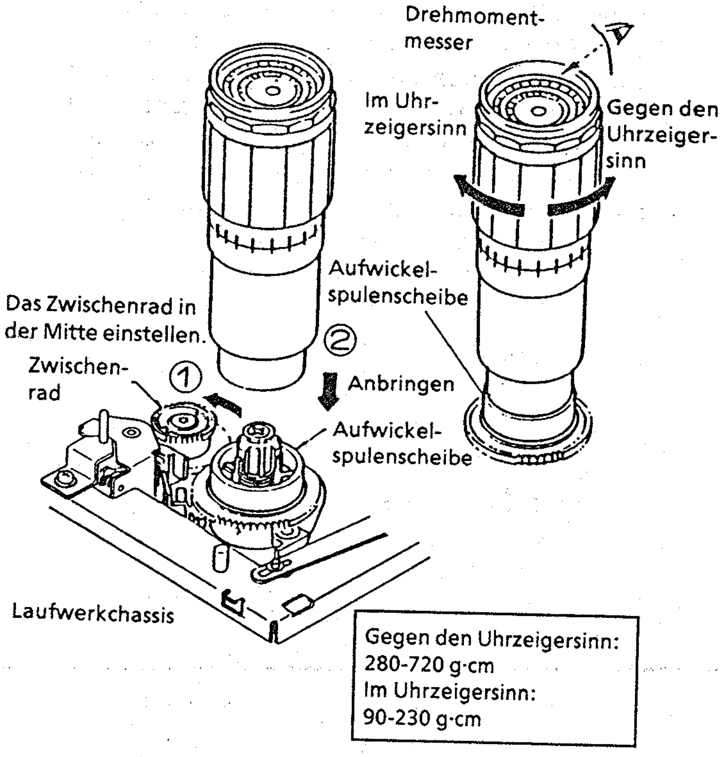

Drehmoment-messer
Gegen den Uhrzeigersinn
Im Uhrzeigersinn
②
Anbringen
Abwickelspulen-scheibe
①
Zwischen-rad
Abwickel-spulenscheibe
Laufwerkchassis
Das Zwischenrad in der Mitte einstellen.

Im Uhrzeigersinn:
280-720 g·cm
Gegen den Uhrzeigersinn:
90-230 g·cm

Abbildung 1-42.

1. Das Cassettengehäuse entfernen.
2. Das Laufwerk in die Stopp - Betriebsart bringen, indem das Netzkabel in den Betriebsarten Schnellvorlauf oder Rückspulung abgezogen wird.
3. Den Drehmomentmesser langsam im und gegen den Uhrzeigersinn der Abwickelspulenbremese drehen, so daß sich die Spulenscheibe und der Zeiger des Drehmomentmessers mit gleicher Geschwindigkeit bewegen. Sicherstellen, daß die Meßwerte im Uhrzeigersinn zwischen 280 und 720 g·cm liegen. Im Gegenuhrzeigersinn müssen die Meßwerte zwischen 90 und 230 g·cm liegen. Das Bremsdrehmoment im Uhrzeigersinn muß wenigstens doppelt so hoch wie jenes in Gegenuhrzeigerrichtung sein.

● Überprüfung des Bremsdrehmoments an der Aufwickelseite


Drehmoment-messer
Im Uhr-zeigersinn
Gegen den Uhrzeiger-sinn
Aufwickel-spulenscheibe
Das Zwischenrad in der Mitte einstellen.
②
Zwischen-rad
①
Anbringen
Aufwickel-spulenscheibe
Laufwerkchassis

Gegen den Uhrzeigersinn:
280-720 g·cm
Im Uhrzeigersinn:
90-230 g·cm

Abbildung 1-43.

1. Das Cassettengehäuse entfernen.
2. Den Drehmomentmesser langsam im und gegen den Uhrzeigersinn der Aufwickelspulenbremse drehen, so daß sich die Spulenscheibe und der Zeiger des Drehmomentmessers mit gleicher Geschwindigkeit bewegen. Sicherstellen, daß die Meßwerte im Gegenuhrzeigersinn zwischen 280 und 720 g·cm liegen. Im Uhrzeigersinn müssen die Meßwerte zwischen 90 und 230 g·cm liegen. Das Bremsdrehmoment in Gegenuhrzeigerrichtung muß wenigstens doppelt so hoch wie jenes im Uhrzeigersinn sein.

● Überprüfung des Bremsdrehmoments an der Auf - und Abwickelseite

1. Wenn das Bremsdrehmoment auf der Auf - oder Abwickelseite außerhalb des Sollwerts liegt, den Bremshebelfilz der Abwickelspulenscheibe oder Aufwickelspulenscheibe mit Reinigungsflüssigkeit säubern und das Drehmoment erneut überprüfen.
2. Wenn das Bremsdrehmoment an der Auf - oder Abwickelseite immer noch außerhalb des Sollwerts liegt, muß die Hauptbremse oder die Hauptbremsfeder erneuert werden.

AUSWECHSELN DER HAUPTBREMSE

1. Den Spulenriemen und das Spulenblock-Flachkabel entfernen.
2. Die Schlitzunterlegscheibe ① vom Bremsumschalter entfernen.
3. Die vier Schrauben ② und dann den Aufwickelspulenhalter losdrehen.
4. Die Spulenblockeinheit Ⓐ nach unten herausnehmen.
5. Zuerst die Schlitzunterlegscheibe ③ und dann die Spulenriemenscheibe entfernen.
6. Die beiden Schrauben ④ losdrehen und die Zwischenradeinheit abnehmen.
7. Die Rückzug-Spannhebelfeder ⑤ aushaken und den Rückzug-Spannhebel ⑥ entfernen. (Den Haken unter der Bremsumschaltereinheit lösen.)
8. Den Umschalterriegel ⑦ öffnen und die Bremsumschaltereinheit ⑧ entfernen.
9. Die Spulenscheibenklauen ⑬ freigeben und dann die linke ⑨ und rechte ⑩ Spulenscheibe freigeben.
10. Schließlich die Hauptbremshebel ⑪ sowie die Hauptbremsfeder ⑫ entfernen.

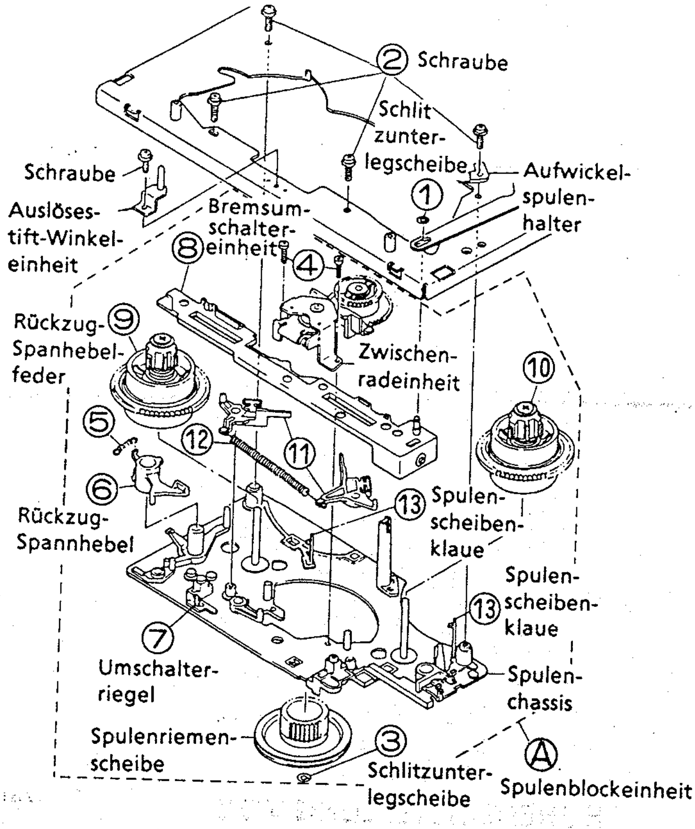

② Schraube
Schlitzunterlegscheibe
Aufwickelspulenhalter
①
Schraube
Auslösestift-Winkeleinheit
Bremsumschaltereinheit
⑧
④
Rückzug-Spanhebelfeder
⑨
Zwischenradeinheit
⑩
⑤
⑫
⑪
⑥
Rückzug-Spannhebel
⑬ Spulenscheibenklaue
⑬ Spulenscheibenklaue
⑦
Umschalterriegel
Spulenchassis
Spulenriemenscheibe
③
Schlitzunterlegscheibe
Ⓐ
Spulenblockeinheit

Abbildung 1-44.

Hinweis:

Beim Auswechseln der Hauptbremse die Überprüfung der Höhe und deren Einstellung vornehmen (siehe Seite 78) sowie die Überprüfung des Brems-drehmoments durchführen (siehe Seite 84).

AUSWECHSELN DES TON - / STEUERKOPFES

1. Das Cassettengehäuse entfernen.
2. Das Gerät in die Entlade - Betriebsart bringen und das Netzkabel abziehen.

- **Ausbau**

1. Die Neigungseinstellschraube ① lockern.
2. Die Azimut - Einstellschraube ② losdrehen.
3. Die Ton - / Steuerkopfschraube ③ losdrehen.
4. Die Ton - / Steuerkopf - Leiterplatte von der Ton - / Steuerkopfeinheit ablöten.

Hinweis:

1. Nach dem Auswechseln unbedingt die Einstellung der Bandantrieb-Kraftübertragung vornehmen (siehe Seite 87). Ein Berühren des Kopfes ist unter allen Umständen zu vermeiden. Wenn der Kopf mit den Fingern berührt wird, ihm mit Alkohol reinigen.
2. Vorsicht, damit die Azimutfeder beim Losdrehen des Ton - / Steuerkopfschraube nicht wegspringt.

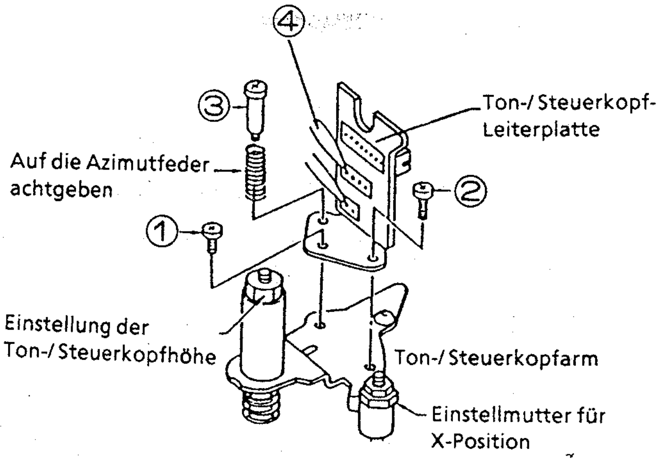

④
③
Ton-/Steuerkopf-Leiterplatte
Auf die Azimutfeder achtgeben
②
①
Einstellung der Ton-/Steuerkopfhöhe
Ton-/Steuerkopfarm
Einstellmutter für X-Position

Abbildung 1-45.

- **Auswechseln**

1. Die entfernte Ton - / Steuerkopf - Leiterplatte auf der neuen Ton - / Steuerkopfeinheit anlöten.
2. Die Ton - / Steuerkopfeinheit ist so angebracht, daß der Ton-/Steuerkopfarm und die Ton-/Steuerkopfplatte ungefähr parallel zueinander liegen.

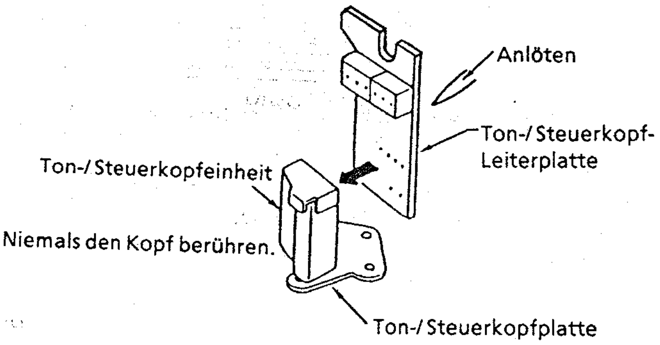

Anlöten
Ton-/Steuerkopf-Leiterplatte
Ton-/Steuerkopfeinheit
Niemals den Kopf berühren.
Ton-/Steuerkopfplatte

Abbildung 1-46.

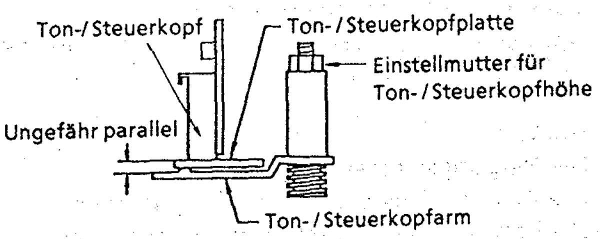
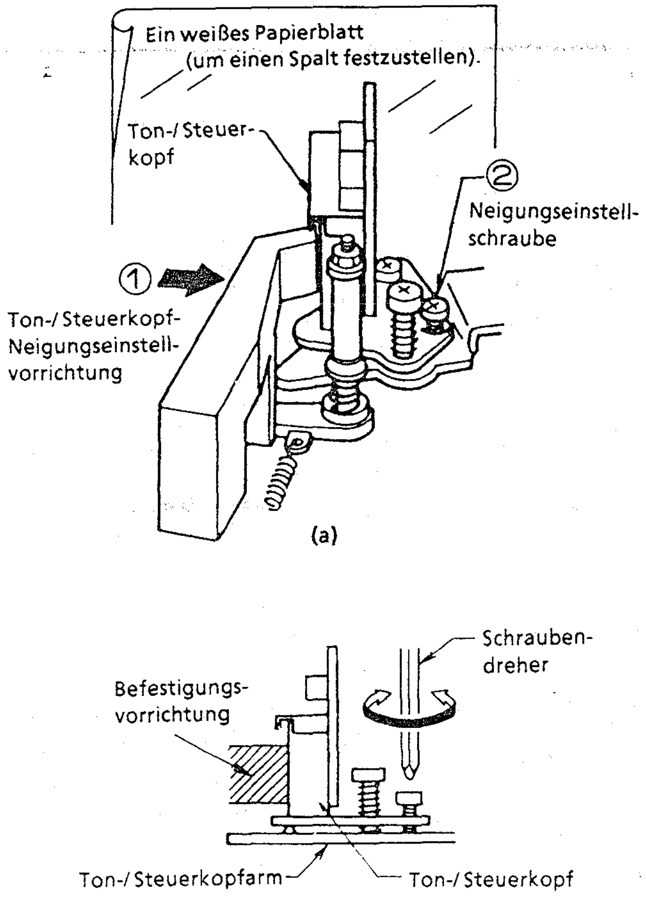

Ton-/Steuerkopf
Ton-/Steuerkopfplatte
Einstellmutter für Ton-/Steuerkopfhöhe
Ungefähr parallel
Ton-/Steuerkopfarm

Abbildung 1-47.

• Einstellung

[Ton - / Steuerkopf - Neigungswinkel]

1. Das Laufwerk in die Lade-Betriebsart bringen.
2. Die Ton- / Steuerkopf - Neigungseinstellvorrichtung ① ansetzen.
3. Die Neigungseinstellschraube ② mit einem Schraubendreher langsam verstellen, bis zwischen der Einstellvorrichtung und dem Ton- / Steuerkopf kein Spalt mehr besteht.

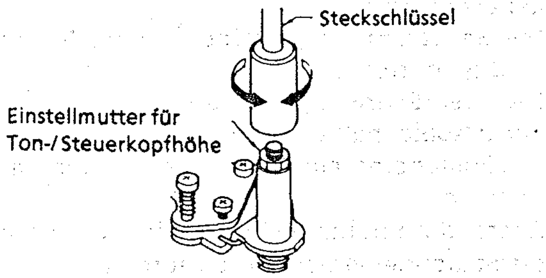

Ein weißes Papierblatt (um einen Spalt festzustellen).
Ton-/Steuerkopf
②
Neigungseinstellschraube
①
Ton-/Steuerkopf-Neigungseinstellvorrichtung
Schraubendreher
Befestigungsvorrichtung
Ton-/Steuerkopfarm
Ton-/Steuerkopf

(a)

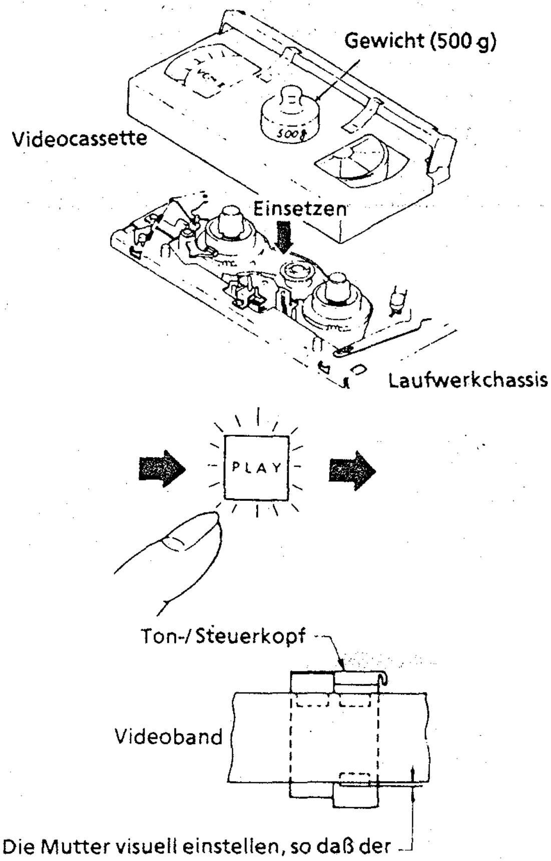
(b)

Abbildung 1-48.

[Grobeinstellung der Ton - / Steuerkopfhöhe]


Steckschlüssel
Einstellmutter für Ton-/Steuerkopfhöhe

Die Grobeinstellung der Ton-/Steuerkopfhöhe durch Drehen der Ton-/Steuerkopf-Sechskanteinstellmutter vornehmen. Hierfür den dafür vorgesehenen Steckschlüssel verwenden. Solange drehen, bis sich das Videoband in der Position befindet, wie in der nachfolgenden Abbildung dargestellt.


Gewicht (500 g)
500g
Videocassette
Einsetzen
Laufwerkchassis
PLAY
Ton-/Steuerkopf
Videoband

Die Mutter visuell einstellen, so daß der Steuerkopf 0.3 bis 0.5 mm unter der Videobandunterseite sichtbar ist.

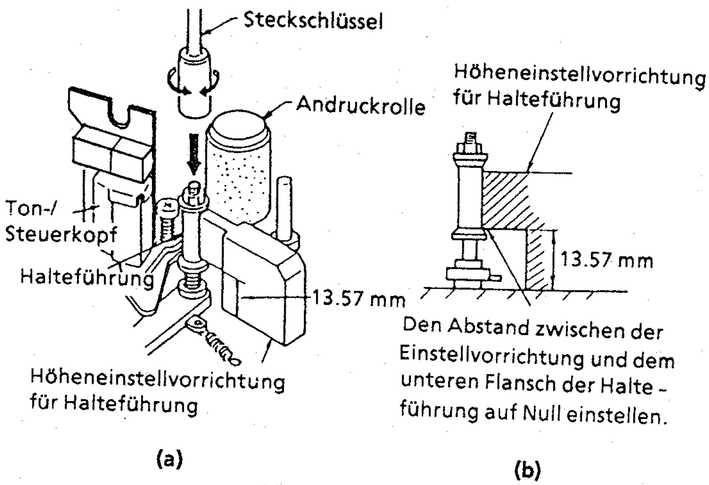
Abbildung 1-49.

HÖHENEINSTELLUNG VON HALTEFÜHRUNG UND RÜCKLAUFFÜHRUNG

Hinweis:

Vor der Grobeinstellung der Bandantrieb-Kraftübertragung überprüfen, ob sich die Höhe der halteführung innerhalb der in Abbildung 1-50 dargestellten Werte befindet (bei Einsatz von Spezialeinstellvor-richtungen).

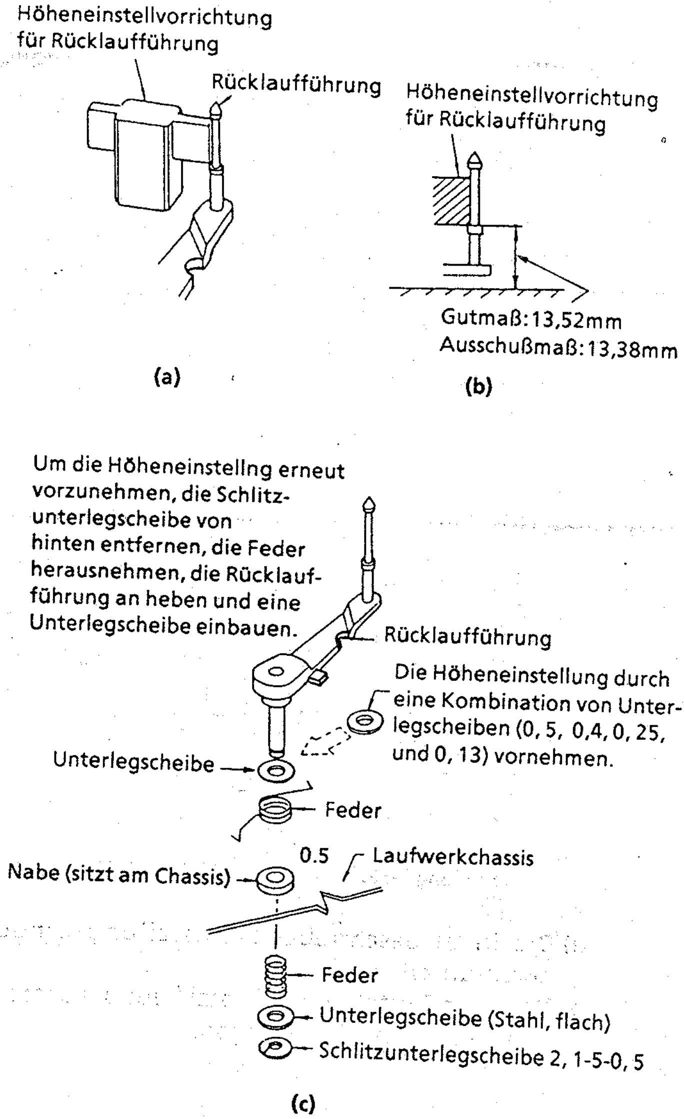
[Höheneinstellung der Halteführung]


Steckschlüssel
Andruckrolle
Ton-/
Steuerkopf
Halteführung
13.57 mm
Höheneinstellvorrichtung
für Halteführung
Höheneinstellvorrichtung
für Halteführung
13.57 mm
(a)
(b)

Den Abstand zwischen der Einstellvorrichtung und dem unteren Flansch der Halteführung auf Null einstellen.

Abbildung 1-50.

[Höheneinstellung der Rücklaufführung]


Höheneinstellvorrichtung
für Rücklaufführung
Rücklaufführung
Höheneinstellvorrichtung
für Rücklaufführung
(a)
(b)
Rücklaufführung
Unterlegscheibe
Feder
0.5
Laufwerkchassis
Nabe (sitzt am Chassis)
Feder
Unterlegscheibe (Stahl, flach)
Schlitzunterlegscheibe 2, 1-5-0, 5
(c)

Gutmaß: 13,52mm
Ausschußmaß: 13,38mm

Um die Höheneinstellng erneut vorzunehmen, die Schlitzunterlegscheibe von hinten entfernen, die Feder herausnehmen, die Rücklaufführung an heben und eine Unterlegscheibe einbauen.

Die Höheneinstellung durch eine Kombination von Unterlegscheiben (0, 5, 0,4, 0, 25, und 0, 13) vornehmen.

Abbildung 1-51.

EINSTELLUNG DER BANDANTRIEB - KRAFTÜBERTRAGUNG

1. Das Cassettengehäuse entfernen.
2. Die Position des Spannstabs überprüfen und einstellen (siehe Seite 82).
3. Die Bildsuchlauf-Rückspul-Rückspannung überpüfen und einstellen (siehe Seite 81).
4. Den Neigungswinkel auf den Ton-/Steuerkopf setzen (siehe Seite 86).
5. Grobeinstellung der Bandantrieb - Kraftübertragung.
   a) Das Oszilloskop an die Prüfkontakte (TP2201) für das Wiedergabe - Chroma - Hüllkurvenausgangssignal (TP2201) anschließen. Die Synchronisation des Oszilloskops auf EXT einstellen. Das Wiedergabe - Chromasignal wird durch den Kopfumschaltimpuls (TP2202) ausgelöst.
   b) Die Einstellschraube am Unterteil der Führungsrolle lockern und mit dem Schraubendreher (JIGDRIVERH-4) so einstellen, daß sich die Führungsrolle reibungslos dreht. (Die Einstellschraube nicht übermäßig lockern, da die Führungsrolle dadurch instabil wird (siehe Abb. 1-52).
   c) Das Abgleichband (Monoskopmuster) auf die Spulenscheibe setzen, dann das Gerät auf Wiedergabe schalten. (Ein Gewicht von ca. 500 g auf die Cassette legen, um diese stabil zu halten.)

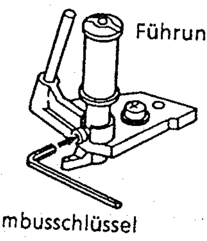

Führungsrolle
Imbusschlüssel

Abbildung 1-52.

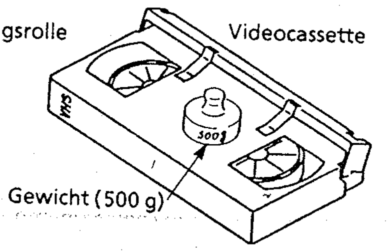
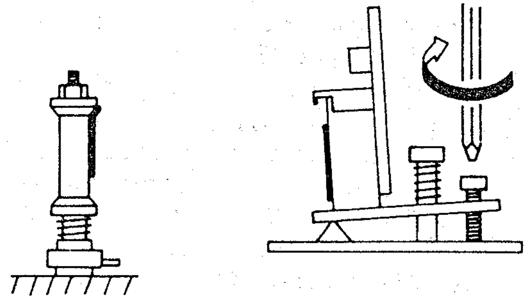

Videocassette
VHS
500 g
Gewicht (500 g)

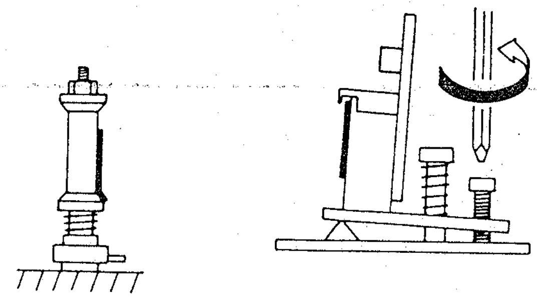
Abbildung 1-53.

   d) Die Hüllkurve von MAX auf MIN sowie MIN auf MAX verändern, indem die (+) bzw. (−) Spurlagentaste betätigt wird. Ebenfalls überprüfen, ob die Hüllkurve einen linearen Frequenzgang aufweist.
   e) Wenn kein linearer Frequenzgang erreicht wird, die Führungsrollen an der Auf - und Abwickelseite mit dem Einstellschraubendreher grob einstellen, bis ein linearer Frequenzgang erreicht ist.
   f) Die Neigungseinstellschraube des Ton-/Steuerkopfs mit einem Schraubendreherverstellen, um einer Bandbeschädigung (Bandfalten) an den oberen und unteren Stirnseiten der Führung vorzubeugen.

1) Banfalten an der oberen Stirnseite: Die Einstellschraube im Uhrzeigersinn drehen (siehe Abb. 1-54 (a).)
2) Bandfalten an der unteren Stirnseite: Die Einstellschraube gegen den Uhrzeigersinn drehen (siehe Abb. 1-54 (b).)


Bandfalten an der oberen Stirnseite
Im Uhrzeigersinn

(a)


Bandfalten an der unteren Stirnseite
Gegen den Uhrzeigersinn

(b)

Abbildung 1-54.

Hinweise:
1. Den Spurlagenregler in die Mittelposition bringen und die x - Position - Einstellmutter so justieren, daß die Wie-dergabe - Chroma - Hüllkurve den Maximalpegel erreicht. Dadurch wird die Grobeinstellung der Bandantrieb - Kraftübertragung erleichtert.
2. Bei der Grobeinstellung spezielle Beachtung der Ausgangsseite zuwenden.

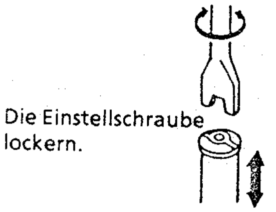

Die Einstellschraube lockern.

Abbildung 1-55.

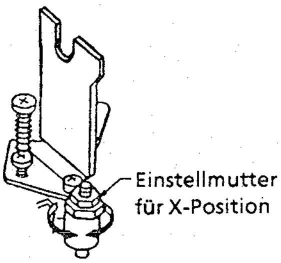

Einstellmutter für X-Position

Abbildung 1-56.

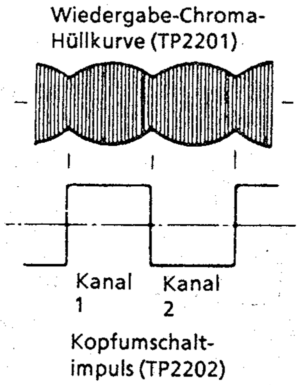

Wiedergabe-Chroma-Hüllkurve (TP2201)
Kanal 1
Kanal 2
Kopfumschaltimpuls (TP2202)

Abbildung 1-57.

6. Einstellung der Höhe von Ton - / Steuerkopf und Azimut
   a) Ein Oszilloskop an die Audio-Ausgangsbuchse anschließen.
   b) Ein Abgleichband verwenden und das 6-kHz - Audiosignal (Monoskopmuster für Videosignal) wiedergeben. Die Azimut- Einstellschraube justieren, um das max. Audio - Ausgangssignal am Oszilloskop zu erhalten (siehe Abbildung 1-58).
   c) Ein Abgleichband verwenden und das 1-kHz-Audiosignal (Farbbalken - oder Videosignal) wiedergeben. Dabei die Ton - / Steuerkopf - Höheneinstellschraube langsam mit einem Steckschlüssel drehen, um das max. Audio - Ausgangssignal zu erhalten.

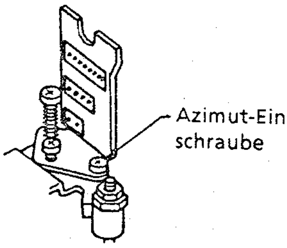

Azimut-Einstellschraube

Abbildung 1-58.

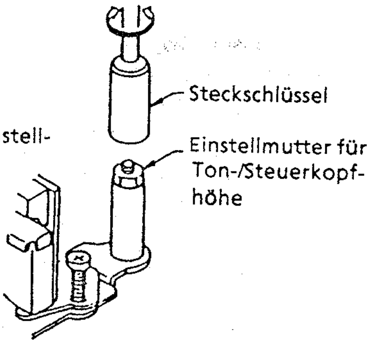

Steckschlüssel
Einstellmutter für Ton-/Steuerkopfhöhe

Abbildung 1-59.

   d) Die in b) beschriebene Einstellung erneut durchführen.
   e) Nach der Einstellung "Glyptal" auf die Schrauben und Muttern aufbringen.

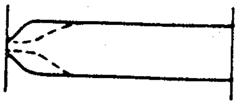
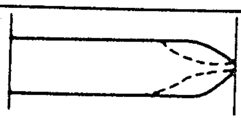
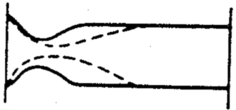
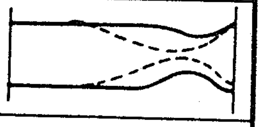
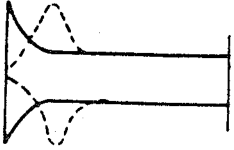
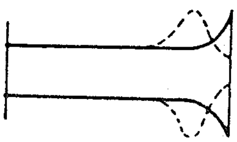
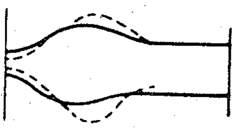
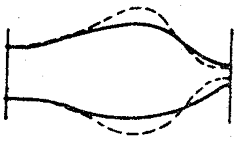
	Wenn sich das Band über der Bandschrägführung befindet		Wenn sich das Band unter der Bandschrägführung befindet	
	Abwickelseite	Aufwickelseite	Abwickelseite	Aufwickelseite
				
				
Einstellung	Die Führungsrolle auf der Abwickelseite im Uhrzeigersinn drehen (Führungsrolle wird abgesenkt), um einen linearen Frequenzgang der Hüllkurve zu erzielen.	Die Führungsrolle auf der Aufwickelseite im Uhrzeigersinn drehen (Führungsrolle wird abgesenkt), um einen linearen Frequenzgang der Hüllkurve zu erzielen.	Die Führungsrolle auf der Abwickelseite gegen den Uhrzeigersinn drehen (Führungsrolle wird angehoben), um das Band über der Bandschrägführung anzuordnen. Die Führungsrolle auf der Abwickelseite wird dann im Uhrzeigersinn verstellt, um einen linearen Frequenzgang der Hüllkurve zu erzielen.	Die Führungsrolle auf der Aufwickelseite gegen den Uhrzeigersinn drehen (Führungsrolle wird angehoben), um das Band über der Bandschrägführung anzuordnen. Die Führungsrolle auf der Abwickelseite wird dann im Uhrzeigersinn verstellt, um einen linearen Frequenzgang der Hüllkurve zu erzielen.

Abbildung 1-60.

7. Einstellung von Bandantrieb - Kraftübertragung und x-Position
   a) Das Oszilloskop an die Prüfkontakte (TP2201) für das Wiedergabe- Chroma- Hüllkurvenausgangssignal anschließen. Die Synchronisation des Oszilloskops auf EXT einstellen. Das Wiedergabe - Chromasignal wird durch den Kopfumschaltimpuls (TP2202) ausgelöst.
   b) Das Abgleichband für die Bandantrieb-Kraftübertragung wiedergeben.
   c) Die Hüllkurve von MAX auf MIN sowie MIN auf MAX verändern, indem die (+) oder. (−) Spurlagentaste betätigt wird.
   Die Führungsrollenhöhe auf der Auf - und Abwickelseite mit einem Einstellschraubendreher justieren, um eine Hüllkurve mit einem möglichst linearen Frequenzgang zu erzielen.
   d) Wenn sich das Band über oder unter der Bandschrägführung befindet, nimmt die Wiedergabe - Chroma - Hüllkurve die in Abbildung 1-60 dargestellte Form an.
   e) Die Hüllkurve auf den max. linearen Frequenzgang einstellen (siehe Schritte 5, e auf Seite 87).
   f) Die Spurlagentaste (+) oder (−) betätigen, um zu sicherzustellen, daß ein flacher Hüllkurven - Frequenzgang erreicht wurde.
   g) Die Führungsrolle durch Festziehen der Führungsrollen - Einstellschraube in der Entlade - Betriebsart sichern.
   h) Das Abgleichband für die Bandantrieb- Kraftübertragung wiedergeben. Die Hüllkurve darf sich dabei nicht verändern.

8. Einstellung der x - Position des Ton-/ Steuerkopfes
   a) Die Spurlagentasten (+) und (−) zugleich inder Voreinstell - Betriebsart betätigen.
   b) Die x - Position- Einstellmutter mit einem Einstellstecknuß-Schraubendreher verstellen und die Ton-/Steuerkopfposition auf den max. Kopfumschaltimpuls an der unteren Flanke der Hüllkurve justieren.
   c) Den Wiedergabe - Umschaltpunkt einstellen.
   d) Den linearen Frequenzgang der Hüllkurve sowie den Ton bei Wiedergabe eines bespielten Bands überprüfen.

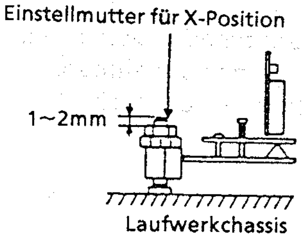


Abbildung 1-61.

AUSWECHSELN DES BANDDIREKTANTRIEBSMOTORS

- **Das Cassettengehäuse entfernen.**

- **Ausbau (Der Reihenfolge der angezeigten Nummern folgen.)**

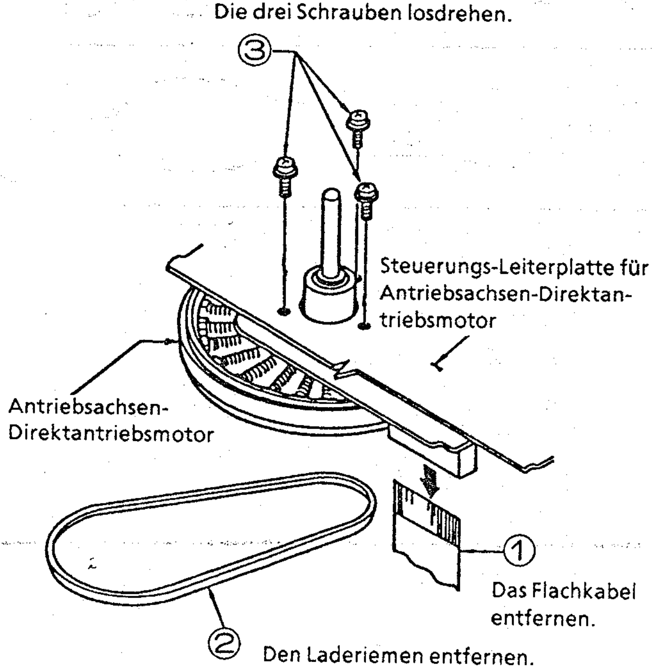

Die drei Schrauben losdrehen.
③
Steuerungs-Leiterplatte für Antriebsachsen-Direktantriebsmotor
Antriebsachsen-Direktantriebsmotor
①
Das Flachkabel entfernen.
②
Den Laderiemen entfernen.

Abbildung 1-62.

- **Einbau**

1. Den Banddirektantriebsmotor am Laufwerkchassis anbringen. Dabei darauf achten, daß die Antriebsachse nicht gegen das Chassis schlägt. Mit den drei Schrauben festziehen.
2. Das Flachkabel in die Steuerungs - Leiterplatte des Banddirektantriebsmotors einführen.
3. Den Spulenriemen anbringen.

Hinweise:

1. Nach Einbau des banddirektantriebsmotors die Antriebsachse drehen und auf reibungslosen Lauf überprüfen.
2. Den Servoschaltkreis überprüfen und einstellen.

AUS - UND EINBAU DES LADEZAHNRADBLOCKS

1. Das Cassettengehäuse entfernen.
2. Den Spulenriemen abnehmen.
3. Den Spulenblook ausbauen.

- Ausbau

Hinweise :

1. Vorsicht, damit die Teile nicht deformiert werden, welche an den folgenden Bauteilen hängen:
   Aufwickelspulen-Ladezahnrad sowie Abwickelspulen-Ladezahnrad (siehe Abbildung 1-63).

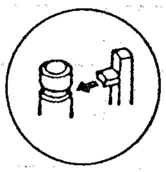


Abbildung 1-63.

2. Vor dem Ausbau des Ladezahnrads die Führungsrolle mit einem Gummiband etc. befestigen. Dadurch wird der Einbau erheblich erleichtert.

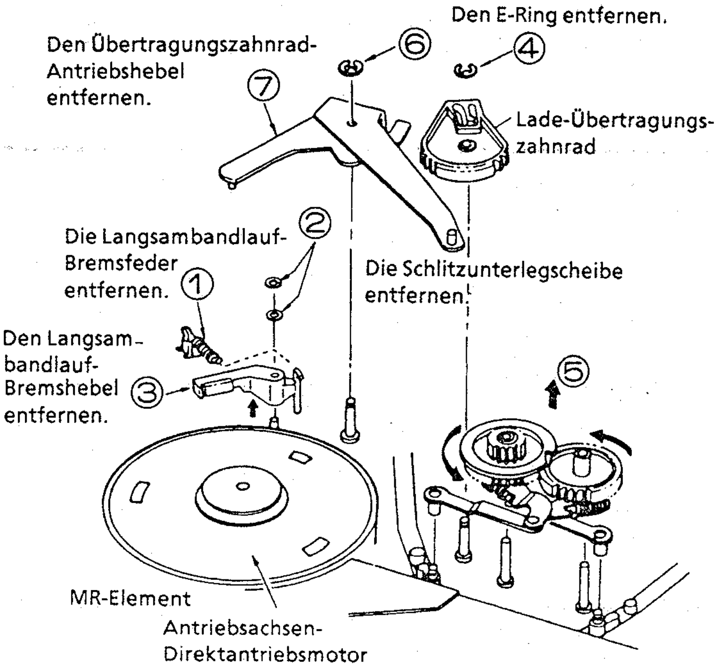

Den E-Ring entfernen.
Den Übertragungszahnrad-Antriebshebel entfernen.
⑥
④
⑦
Lade-Übertragungs-zahnrad
Die Langsambandlauf-Bremsfeder entfernen.
②
①
Die Schlitzunterlegscheibe entfernen.
Den Langsam-bandlauf-Bremshebel entfernen.
③
⑤
MR-Element
Antriebsachsen-Direktantriebsmotor

Abbildung 1-64.

1. Die Langsambandlauf-Bremsfeder ① entfernen.
2. Die Schlitzunterlegscheibe ② entfernen.
3. Den Langsambandlauf-Bremshebel ③entfernen.
4. Den E-Ring ④ entfernen.
5. Das Aufwickelspulen-Ladearm, die Aufwickelspulen-Ladearmeinheit, das Abwickelspulen-Ladezahnrad sowie die Abwickelspulen-Ladearm- einheit leicht in Laderichtung drehen, und danach alle Teile ⑤herausnehmen.
6. Den E-Ring ⑥ entfernen.
7. Den Übertragungszahnrad-Antriebshebel ⑦ entfernen.

- **Einbau**

Das Ausbauverfahren umkehren. Unbedingt die Kennmarken der Zahnräder ausrichten.

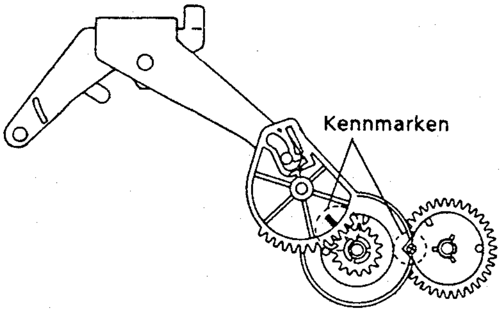


Abbildung 1-65.

Hinweise:

1. Beim Einbau vorgeschriebenes Fett auf die folgenden Punkte auftragen: alle Zähne der Zahnräder, alle Zahnradwellen und auf die Nockennut des Lade-übertragungszahnrads.
2. Vorsicht. daß die Auf-und Abwickelladearme nicht deformiert werden.
3. Den Filz des Langsambandlauf-Bremshebels unbedingt sauberhalten.
4. Ebenso die Außenseite des Banddirektantriebsmotors vor Verunreinigungen schützen. (Bei Verschmutzung kann es zur Beschädi-gung des Magnetwiderstands kommen.)
5. Vorsicht, damit die Halterungshaken von Langsambandlauf-Bremshebel, sowie Aufwickel- und Abwickel-Ladezahnräder nicht mehr als erforderlich deformiert werden.

AUS- UND EINBAU DES LADEBLOCKS

- **Ausbau**

1. Die kabel ① abtrennen.
2. Den Cassetten-Laderiemen ② entfernen.
3. Die drei Schrauben ③ losdrehen.
4. Den Ladeblock nach oben ziehen.

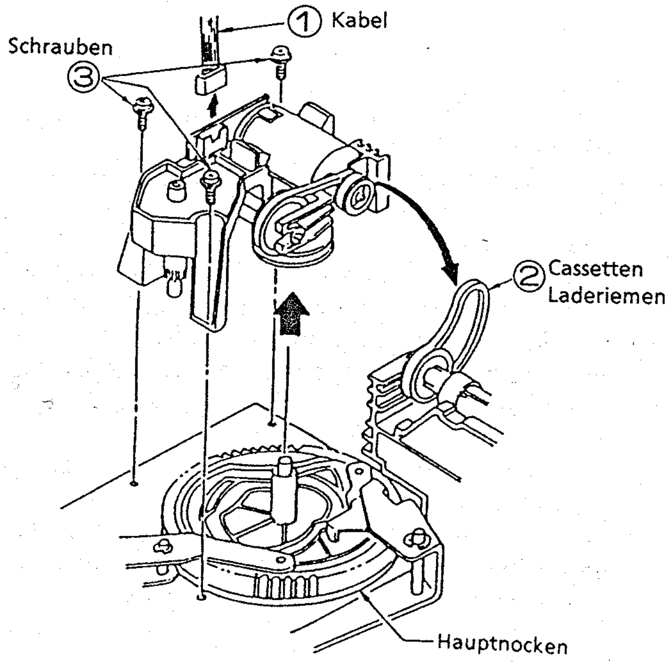


Abbildung 1-66.

Hinweis:
Bei Benutzung eines magnetisierten Schraubendrehers für die drei Schrauben darf dieser den Ton-/Steuerkopf und die Trommel nicht berühren.

- **Einbau**

1. Den Hauptnocken ganz gegen den Uhrzeigersinn drehen.
2. Die Kennmarke am Nockenschalter mit der Ausrichtmarke in Übereinstimmung bringen. Den Ladeblock und den Hauptnocken ineinander einpassen. Die drei Schrauben wieder festziehen.

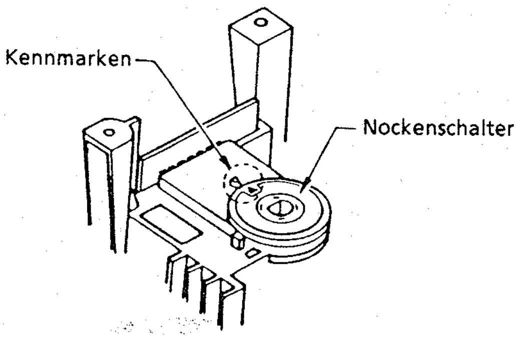


Abbildung 1-67.

3. Schließlich die Kabel wieder anschließen und den Cassetten-Laderiemen anlegen.

Hinweise:

1. Vorsicht, damit das Ladezahnrad nicht beschädigh wird.
2. Vorsicht, damit der Riemen nicht versohmutzt wird. Bei Versohmutzung mit der Vorgeschriebenen Reinigungsflüssigkeit säubern.

AUSWECHSELN DES LADEMOTORS

1. Das Gerät in die Cassettenauswurf-Betriebsart bringen.
2. Das Netzkabel abziehen.
3. Den Ladeblock gemäß der obigen Beschreibungen und bildlichen Darstellungen entfernen.

- **Ausbau**

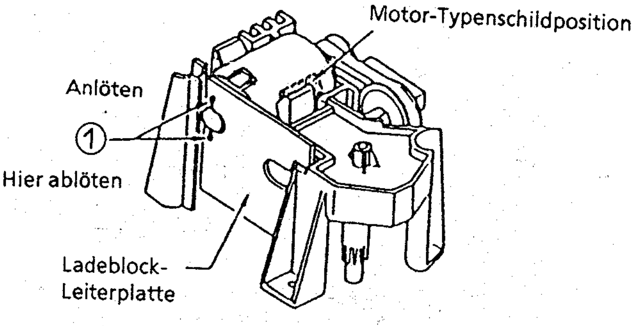
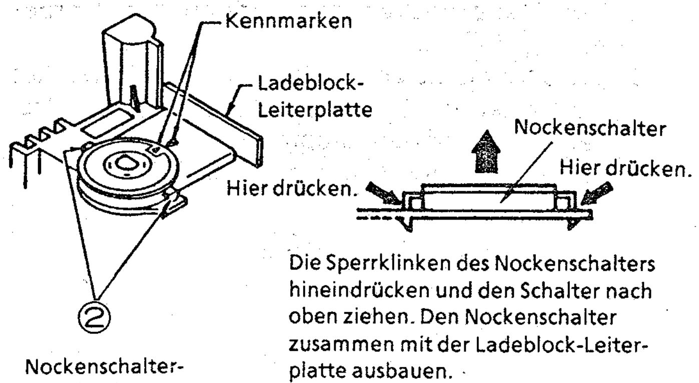


Abbildung 1-68.

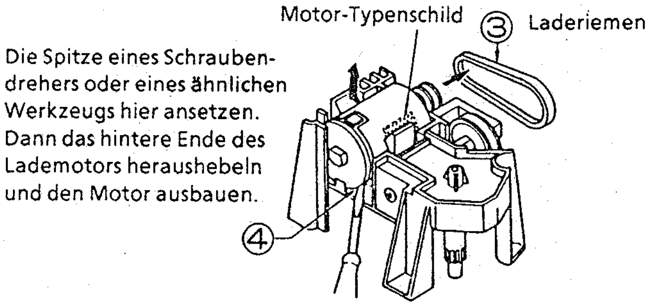
1. Die kabel ① vom Lademotor ablöten.
2. Die rechten und linken Haltehaken ② des Nockenschalters außerhalb des Ladeblocks entriegeln. Danach den Nockenschalter und die Ladeblock-Leiterplatte herausnehmen (siehe Abbildung 1-69).


Kennmarken
Ladeblock-Leiterplatte
Nockenschalter
Hier drücken.
Hier drücken.
②
Nockenschalter-Sperrklinke

Die Sperrklinken des Nockenschalters hineindrücken und den Schalter nach oben ziehen. Den Nockenschalter zusammen mit der Ladeblock-Leiterplatte ausbauen.

Abbildung 1-69.

3. Den Laderiemen ③ entfernen.
4. Das hintere Ende des Lademotors mit einem Schraubendreher oder einem vergleichbaren Werkzeug heraushebeln (siehe Abbildung 1-70), und dann den Motor herausnehmen.


Motor-Typenschild
③ Laderiemen
④

Die Spitze eines Schraubendrehers oder eines ähnlichen Werkzeugs hier ansetzen. Dann das hintere Ende des Lademotors heraushebeln und den Motor ausbauen.

Abbildung 1-70.

- **Einbau**

1. Den Lademotor ausbauen und einen neuen Motor installieren (siehe Abbildung 1-71).
2. Den Motor so anbringer, daß das Etikett wie in Abbildung 1-71 sichtbar ist. Sicherstellen, daß das Schraubloch in der Motorwelle, der Vorsprung am Ladeblock und das rückwärtige Ende des Motors (Pfeilmarke) miteinander ausgerichtet sind.

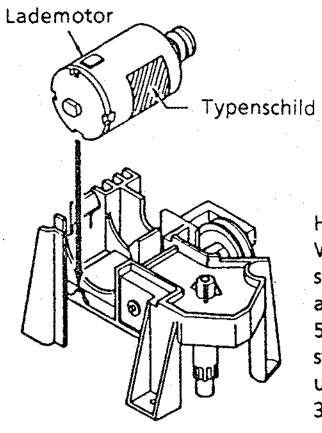
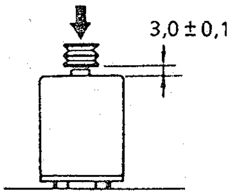

Lademotor
Typenschild

Abbildung 1-71.



Hinweis:
Wenn die Lademotor-Riemenscheibe auf die Motorachse aufgedrückt wird, höchstens 5 kg druck ausüben. Der Abstand zwischen dem Motor und der Riemenscheibe muß 3,0 ± 0,1 mm betragen.

Abbildung 1-72.

3. Die Ladeblock-Leiterplatte und den Nockenschalter einbauen.
4. Die Kabel am Lademotor anlöten.
5. Schließlich den Ladeblock anbringen (siehe Seite 91).
6. Den Laderiemen.anbringen.

AUSWECHSELN DES HAUPTNOCKENS

- **Asubau**

1. Den E-Ring ① entfernen.
2. Den Halb-Ladeantriebshebel ② entfernen.
3. Den E-Ring ③ entfernen.
4. Den Andruckrollenhebel ④ entfernen.
5. Den Hauptnocken ⑤nach oben herausziehen.

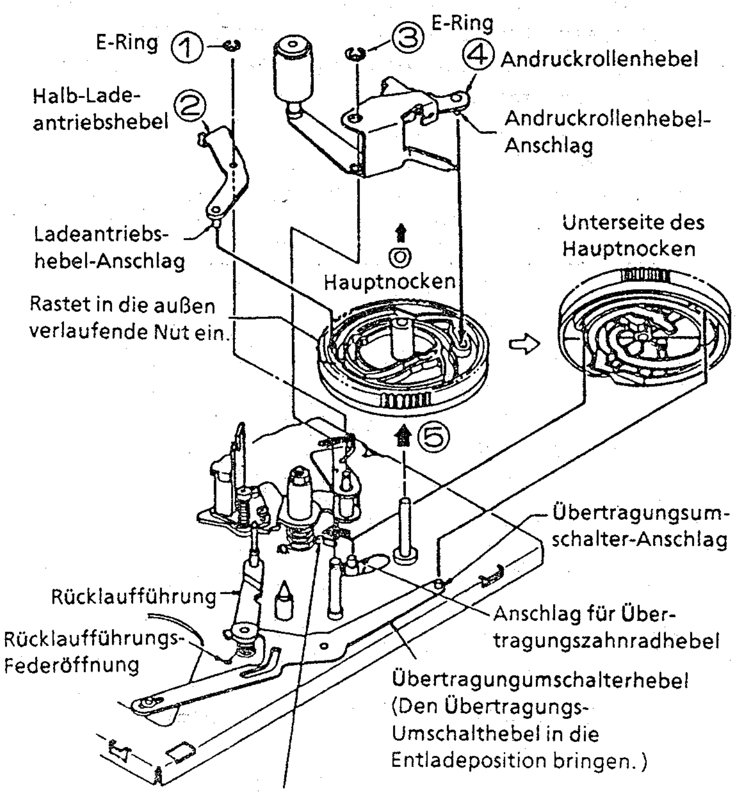

E-Ring ①
③ E-Ring
④ Andruckrollenhebel
Halb-Lade-antriebshebel ②
Andruckrollenhebel-Anschlag
Ladeantriebs-hebel-Anschlag
⑥
Hauptnocken
Unterseite des Hauptnocken
Rastet in die außen verlaufende Nut ein.
⑤
Übertragungsumschalter-Anschlag
Rücklaufführung
Rücklaufführungs-Federöffnung
Anschlag für Übertragungszahnradhebel
Übertragungumschalterhebel (Den Übertragungs-Umschalthebel in die Entladeposition bringen.)
Langsambandlauf-Bremhebel-Anschlag

Abbildung 1-73.

- **Einbau**

1. Den Übertragungszahnrad-Antriebshebel in den Entladezustand bringen.
2. Den Übertragungs-Schalthebel so anbringen, daß er mit der Rückwärtsführungs-Federeinhaköffnung im Laufwerkgehäuse Kontakt aufweist. Den Langsambandlauf-bremshebel mit einem Finger freigeben, so daß sich dieser vom Capstan entfernt (in pfeilrichtung). Danach den Hauptnooken so anbringen, daß die "D"-Aussparung im Hauptnocken in Pfeilrichtung weist.
3. Den Halblade-Nockenstößel so anbringen, daß er in die äußere Nut am Hauptnocken eingreift (siehe Pfeilmarkierung). Danach den E-Ring anbringen und den Andruckrollenhebel befestigen.

4. Den Hauptnocken etwas im Uhrzeigersinn drehen, bis der Andruckrollenhebel-Nockenstößel in die Nut des Hauptnockens einrastet (mit Pfeil markiert). Den Andruckrollenhebel befestigen und dann den E-Ring anbringen.
5. Den Hauptnocken mit der Hand drehen, um sicherzustellen, daß sich alle vier Hebel (Übertragungszahnrad - Antriebshebel, Halb - Ladenhebel, Andruckrollenhebel und Übertragungs-Schalthebel) in den Nockennuten befinden.
6. Den Ladeblock wieder einbauen (siehe Seite 91).

Hinweise:

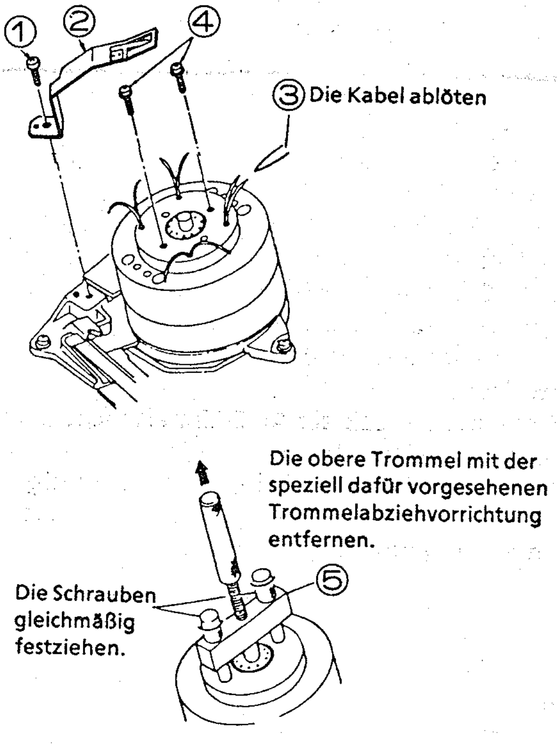
1. Vorsicht, damit die Zähne und Nute des Hauptnocken nicht beschädigt werden.
2. Nach dem Einbau des Hauptnockens muß dieser von Hand gedreht werden, bevor der Ladeblock angebracht wird. Wenn sich die Hebel in den falschen Einbaupositionen befinden, können sie beim Starten des Motors beschädigt werden.
3. Vorgeschriebenes Fett auf die Nuten und Zähne des Hauptnockens auftragen.

AUSWECHSELN DER OBEREN TROMMEL

Hinweis:

Der Abstand zwischen der oberen und unteren Trommel ist äußerst präzise eingestellt (im Mikromillimeterbereich). Beim Auswechseln muß daher größte Sorgfalt angewendet werden. Sogar der geringste Fremdkörper kann die Präzision beim Einbau beeinträchtigen.

- **Auswechseln (Der Reihenfolge der angezeigten Nummern folgen.)**



③ Die Kabel ablöten

Die obere Trommel mit der speziell dafür vorgesehenen Trommelabziehvorrichtung entfernen.

Die Schrauben gleichmäßig festziehen.

Abbildung 1-74.

Hinweise:

1. Die Berührung der Trommeloberfläche mit bloßen Händen unbedingt vermeiden.
2. Die obere Trommel mit äußerster Sorgfalt herausziehen (nicht kippen). Hierfür die speziell dafür vorgesehene Feststellvorrichtung benutzen. Vorsicht, damit der Scheibenumfang nicht beschädigt wird.
3. Niemals auf die Schrauben schlagen, wenn sie festgezogen werden.

- Einbau

Hinweise:

1. Vor dem Einbau der Trommel sicherstellen, daß sich keine kratzer oder Staub auf kante und Umfang der Scheibe befinden.
2. Vor dem Einbau der Trommel sicherstellen, daß sich keine Kratzer und kein Staub auf der inneren Oberfläche und der Kante der oberen Trommel befinden.
3. Beim Einbau dieser Teile die obere Trommel sehr sorgfältig auf die Scheibe setzen, so daß die obere Trommel nicht geneigt wird.
4. Beim Einbau dieser Teile unbedingt darauf achten, daß keine Verunreinigungen zwischen die Scheibe und die obere Trommel gelangen.
5. Die Schrauben nicht übermäßig festziehen.

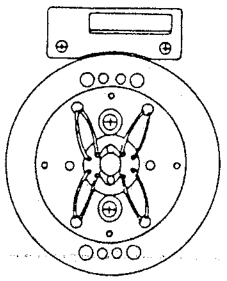


Abbildung 1-75.

1. Die neue Trommel einbauen.
2. Die obere Trommel mit den beiden Schrauben befestigen.
3. Die Kabel anlöten.

   Hinweis:

   Das Löten sollte schnell und sorgfältig durchgeführt werden, ohne dabei in der Nähe befindliche Teile zu berühren.
4. Nach dem Auswechseln müssen die Einstellung der Bandantrieb-Kraftübertragung (siehe Seite 87) sowie die folgenden elektrischen Einstellungen durchgeführt werden.

- Einstellung des Wiedergabe-Umschaltpunktes
- Überprüfung und Einstellung der X-Position
- Einstellung der SP und LP-Langsamabtastung

AUSWECHSELN DES BANDDIREKTANTRIEBSMOTORS

1. Das Gerät in die Cassetten-Auswurfbetriebsart bringen.
2. Das Netzkabel abziehen.

- **Ausbau (Die Einbauschritte umkehren.)**

1. Das Flachkabel ① entfernen.
2. Die beiden Befestigungsschrauben ② des Banddirektantriebsmotors losdrehen.
3. Den Rotor ③des Banddirektantriebsmotors herausziehen.
4. Die drei Statorschrauben ④ des Banddirektantriebsmotors losdrehen.
5. Den Stator ⑤entfernen.

Hinweise:

1. Beim Ausbau des Banddirektantriebsmotors oder des Stators darauf achten, daß das Lade-Übertragungszahnrad nicht angeschlagen wird.
2. Den Rotor so sichern, daß die Einbaupositionslöcher im Rotor mit der unteren Trommel ausgerichtet sind.
3. Vorsicht, daß die obere Trommel oder der Videokopf nicht beschädigt werden.
4. Sicherstellen, daß die Halleinrichtung und der Stator nicht durch den Rotor und andere Teile beschädigt werden.
5. Nach dem Einbau den Wiedergabe-Umschaltpunkt einstellen.

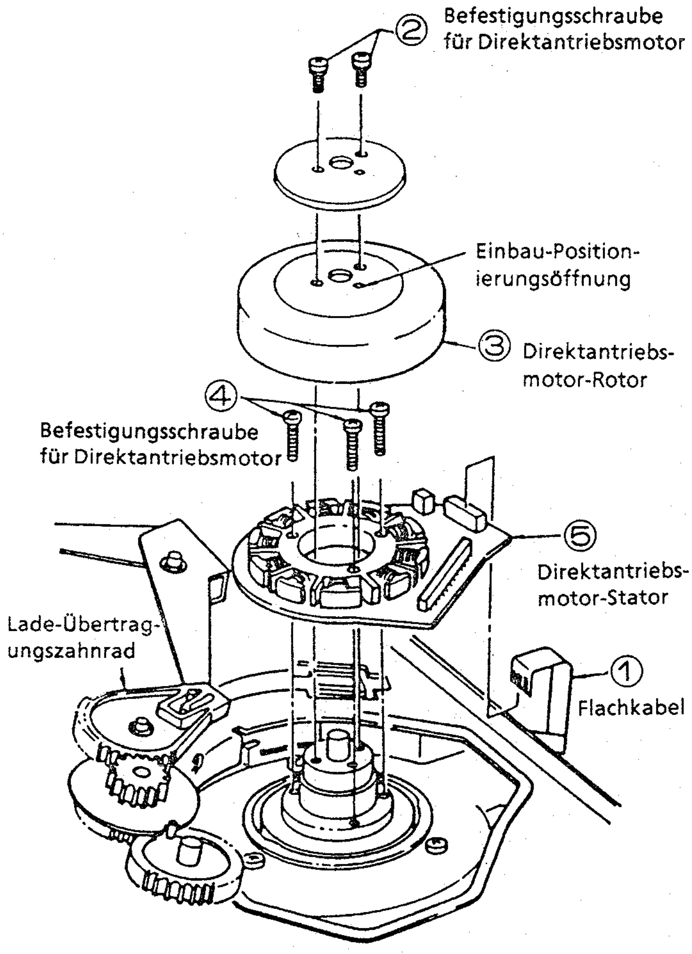

② Befestigungsschraube für Direktantriebsmotor
Einbau-Positionierungsöffnung
③ Direktantriebs-motor-Rotor
④ Befestigungsschraube für Direktantriebsmotor
⑤ Direktantriebs-motor-Stator
Lade-Übertragungszahnrad
① Flachkabel

Abbildung 1-76.

ERSETZEN DES AHC (AUTOMATISCHER KOPFREINIGER)

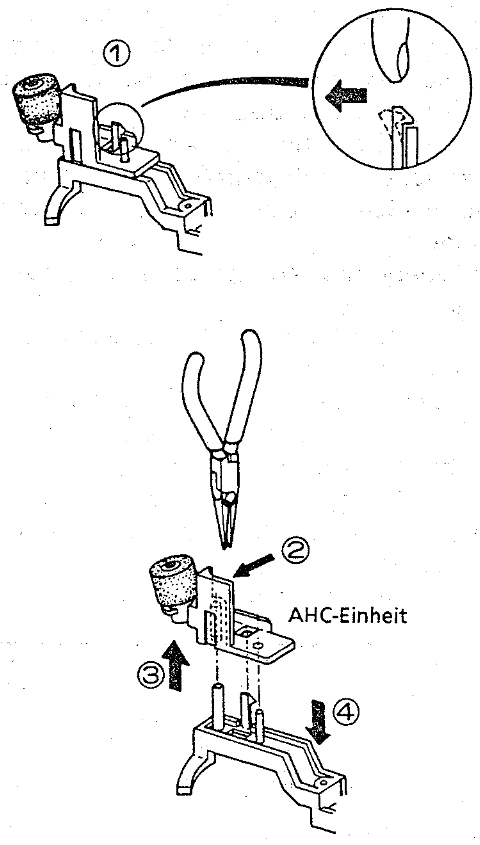

①
②
AHC-Einheit
③
④

Abbildung 1-77.

- **Ausbau**

Den Teil ① mit einem Finger in Pfeilrichtung aushaken. Die Rippe (mit Pfeilmarkierung versehen) der AHC-Einheit ② mit einer Zange festhalten und dir gesamte Einheit in Pfeilrichtung ③ nach oben harausziehen.

Hinweis:

Den AHC-Hebel nach unten drücken, um die AHC-Einheit herausziehen.

- **Einbau**

Die AHC-Einheit in Pfeilrichtung ④ drücken. Sicherstellen, daß die Einheit durch den Haken des Teils ① sicher positioniert ist.

Hinweise:

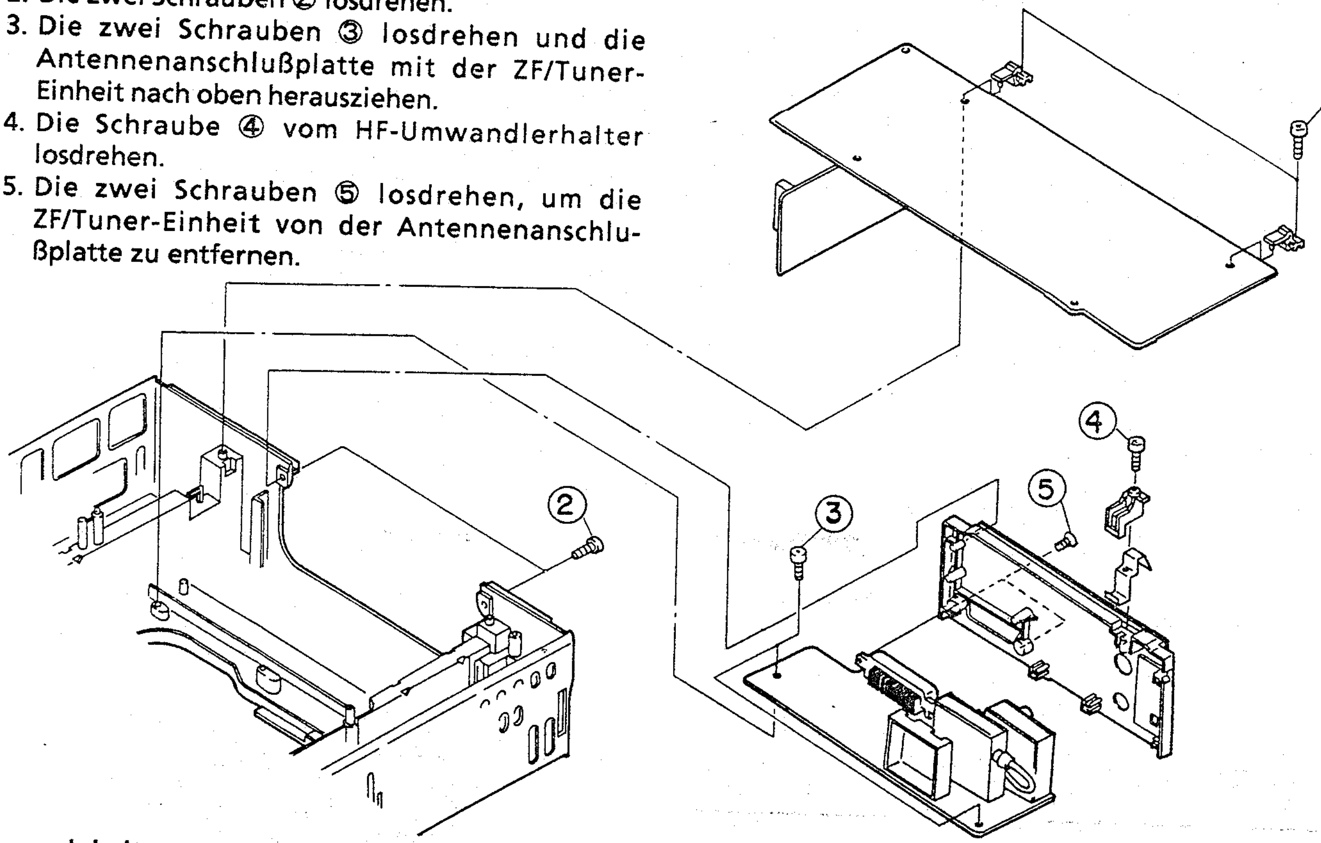
1. Sicherstellen, daß die AHC-Einheit nicht Kontakt die Trommel berührt.
2. Unbedingt darauf achten, daß der Reinigungsbereich der Armeinheit frei von Fett und anderen Verunreinigungen ist.

EINSTELLUNG DER ELEKTRISCHEN SCHALTKREISE

■ AUSBAU DER ZF/TUNER-EINHEIT UND DER STROM-EINHEIT

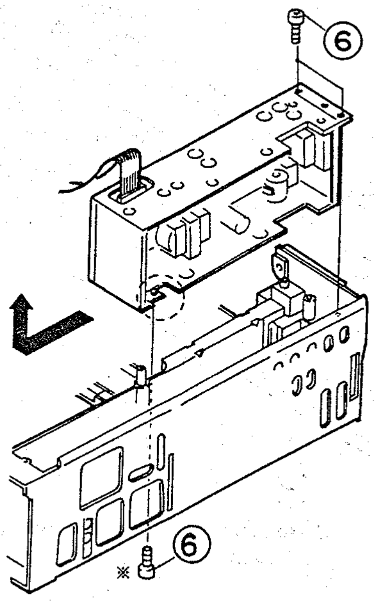
ZF/TUNER-Einheit

1. Die zwei Schrauben ① von der Hauptleiterplatte losdrehen.
2. Die zwei Schrauben ② losdrehen.
3. Die zwei Schrauben ③ losdrehen und die Antennenanschlußplatte mit der ZF/Tuner-Einheit nach oben herausziehen.
4. Die Schraube ④ vom HF-Umwandlerhalter losdrehen.
5. Die zwei Schrauben ⑤ losdrehen, um die ZF/Tuner-Einheit von der Antennenanschlußplatte zu entfernen.



Stromeinheit

1. Die drei Schrauben ⑥ von der Stromeinheit losdrehen.
2. Die Stromeinheit in die Pfeilrichtung schieben, um die Einheit vom Hauptrahmen zu entfernen. Die Stromeinheit dann nach oben herausziehen.



Hinweis:

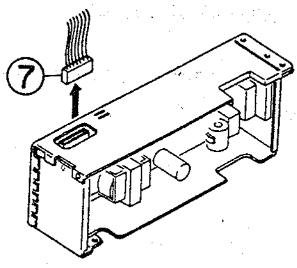
Die ausgezeichneten (※) Schraube werden für die Befestigung der Bodenplatte Verwendet.

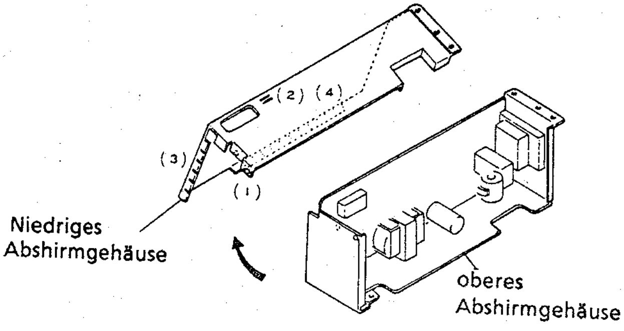
Stromeinheit-Abshirmgehäuse

1. Die Leitung des PA-Steckverbinders ⑦ trennen.
2. Das obere Abshirmgehäuse niederhalten und das niegrige Abschirmgehäuse durch Drehen in die Pfeilrichtung entfernen.

Hinweis:

An den Lagen ① bis ④ in dieser Ordnung für einfache Kupplung zusammenpassen.





Vor der Einstellung:
In den meisten Fällen besteht die Notwendigkeit zur Einstellung elektrischer Schaltkreise durch das Auswechseln mechanischer Bauteile einschließlich des Videokopfs.
Vor der Einstellung elektrischer Schaltkreise ist daher zu überprüfen, ob sämtliche mechanischen Einstellungen bereits abgeschlossen sind.
Wenn elektrische Störungen festgestellt werden, zuerst alle zur Einstellung erforderlichen Geräte überprüfen.
Danach Reparatur oder Austausch der defekten Bauteile durchführen und die Einstellung nach den nachfolgend aufgeführten Verfahren vornehmen.
Wenn die erforderlichen Meßinstrumente nicht vorhanden sind, dürfen die Regler nicht wahllos vorstellt werden.

- **Meßinstrumente**
  - Farbmonitor (TV)
  - Gleichstromversorgung
  - Röhrenvoltmeter
  - Oszilloskop
  - Tongenerator
  - Anschlußkabel (QCNW-6443GEZZ)
  - Farbbalkengenerator
  - Abgleichband
  - Frequenzzähler
  - Unbespieltes Videoband (VHS)

▩ EINSTELLUNG DES HAUPTSTROMKREISSCHALTKREISES

Einstellung des UR6,5V

Meßinstrument	Voltmeter
Betriebsart	Aufnahme (SP-Modus)
Prüfpunkt	Stift 4 von AP-Steckverbinder auf der Hauptleiterplatte
Regler	R928
Einstellpunkt	6,6 ± 0,1 V

1. Das Netzkabel trennen.
2. Die drei Schrauben von der Stromversorgungseinheit losdrehen. Die Vorderseite der Stromversorgungseinheit aufheben und in Pfeilrichtung ⇦ schieben.
3. Das Netzkabel und die Stromversorgung wiederverbinden.
4. Das Voltmeter an den Stift 4 des AP-Steckverbinders sowie an Masse anschließen. (Der AP-Steckverbinder besteht auf der Hauptleiterplatte.)
5. Das Gerät auf Aufnahme schalten. R928 so einstellen, daß das Voltmeter 6,6 ± 0,1 V anzeigt.

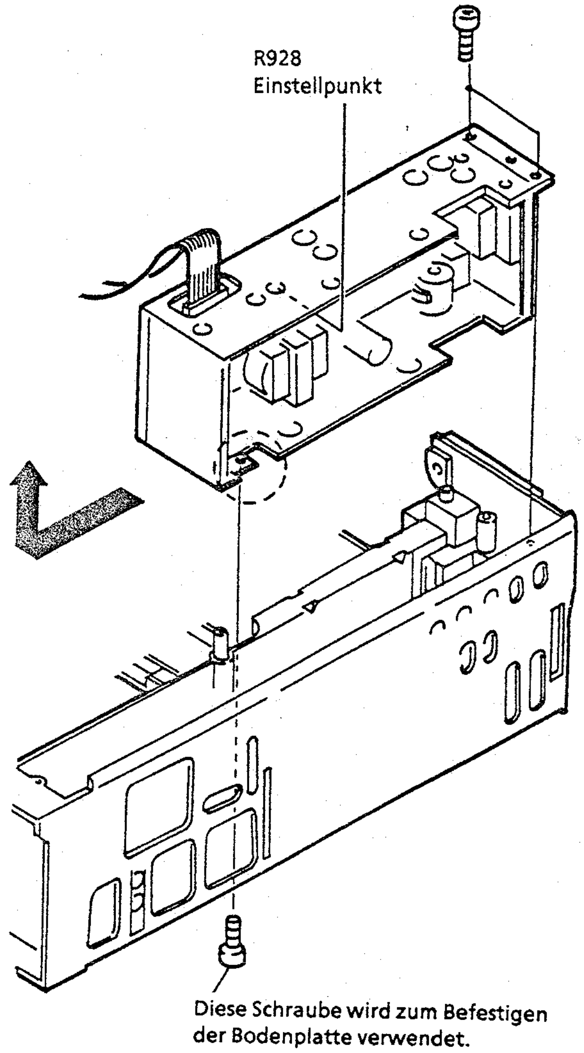

R928
Einstellpunkt
Diese Schraube wird zum Befestigen der Bodenplatte verwendet.

Abbildung 2-1. STROM

EINSTELLUNG DES SYSTEMSTEUERUNGS/REGEL-SCHALTKREISES

- **Prüfpunkt-Diagramm**

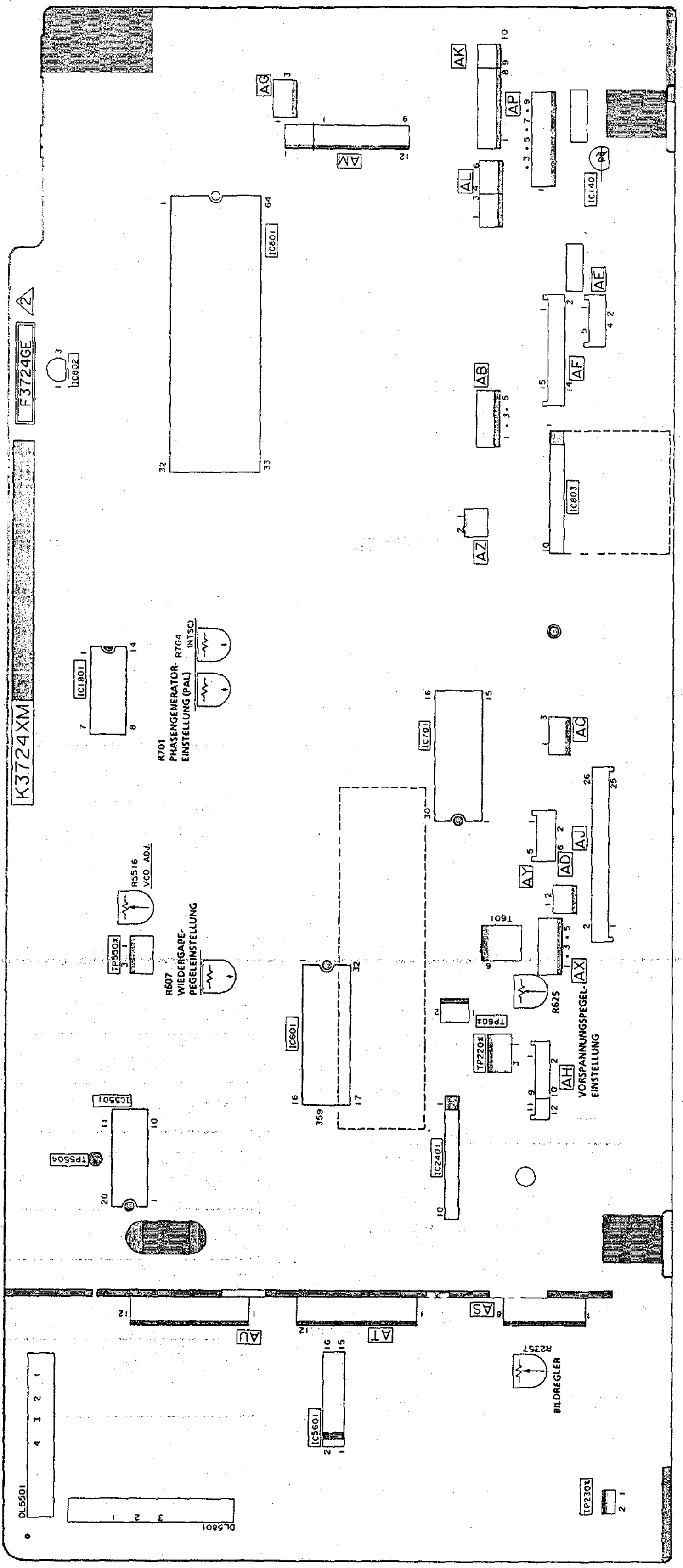

AK
AG
AM
AP
AL
IC140
IC801
F3724GE
IC802
AE
AF
AB
IC803
AZ
IC1801
R704 (NTSC)
R701 PHASENGENERATOR-EINSTELLUNG (PAL)
K3724XM
IC701
AC
AJ
AD
AY
R5516 VCO ADJ.
TP5502
R607 WIEDERGABE-PEGELEINSTELLUNG
T601
AX
R625 VORSPANNUNGSPEGEL-EINSTELLUNG
TP601
TP2201
AH
IC601
IC5501
TP5504
IC2401
AU
AT
AS
R2357
BILDREGLER
IC5601
DL5501
DL5801
TP2301

Abbildung 2-2. HAUPTLEITERPLATTE

EINSTELLUNG DES REGELSCHALTKREISES

Einstellung des Wiedergabe-Umschaltpunkts beim PAL-System

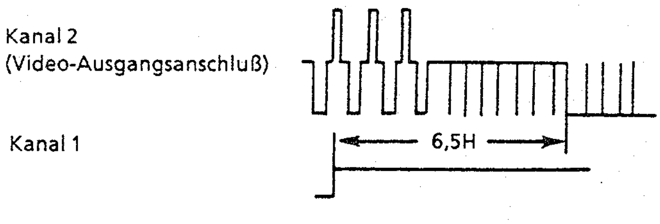
Meßinstrument	Oszilloskop
Betriebsart	Wiedergabe Bildsuchlauf-Knopf in Mittelposition
Eingelegtes Band	Abgleichband (VROCPSV)
Prüfpunkt	Kanal 1; TP2202 Kanal 2; Video-Ausgangsanschluß (Kanal 1 Triggerimpuls-Anstiegsschalter auf (+), interner Triggerimpuls am Kanal 1)
Regler	R701 (Phasengenerator/monostabile Multivibrator)
Spezifikation	6,5 ± 0,5H

1. Ein PAL-Abgleichband (VROCPSV) einlegen und das Gerät auf Wiedergabe schalten.
2. Die Taste drücken, um den Spurlagenregler in die Mittelposition zu schalten. (Siehe nachfolgende Anmerkung.)
3. Den R701 (Phasengenerator) so einstellen, daß die Wellenform am Oszilloskop wie in Abbildung 2-3 erscheint.

Hinweis:

Spurlagenhaltung in Mittelposition

1. Das Cassettengehäuse entfernen.
2. Den Testknopf auf der Timerplatine drücken.



Kanal 1 ; 2V/Teilung 50µsec/Teilung
Kanal 2 ; 1V/Teilung 50µsec/Teilung

Abbildung 2-3.

Einstellung des Standardwidergabe Langsam-Bildsuchlaufreglers (SP/LP) beim PAL-System

Meßinstrument	Monitor (TV)
Betriebsart	Aufnahme und Wiedergabe auf selbstaufgezeichnetem Band.
Eingangssignal	Tonsignal (öffentl. Rundfunksender) oder Videosignal (externer Eingangswahlschalter)
Prüfpunkt	Monitor-Bildschirm
Einstellpunkt	Spurreglertaste (+) oder (–)
Spezifikation	Kein Störbalken am Monitor (TV)-Bildschirm

1. Wiedergabe der Eigenaufnahme im PAL SP/LP-Modus.
2. Den Testknopf drücken, um auf den Prüfmodus umzuschalten.
3. Sicherstellen, daß Anzeige-Leuchtröhren aufleuchten.
4. Die Langsam-Taste drücken und mit der Wiedergabe im Langsam-Modus beginnen.
5. Die Bildspurlage einstellen, indem die Spurreglertaste auf dem Gerät oder der Fernsteuerung gedrückt wird. So vorgehen, daß keine Bildstörungen auftreten.
6. Die Stopptaste drücken, um die im Langsammodus programmierten Daten zu speichern.
7. Die Gesamtlöschtaste drücken, um in den Normalmodus zurückzukehren.

Einstellung des Vertikal-Standbild-Synchronsignals (Falschvertikal)

Meßinstrument	Monitor (TV)
Betriebsart	Standbildwiedergabe
Eingangssignal	Sekbstaufgezeichnetes Band
Prüfpunkt	Monitor-Bildschirm
Einstellpunkt	Spurreglertaste (+) oder (–)
Spezifikation	Keine Vertikal-Synchronisationsstörung

1. Wiedergabe der Eigenaufnahme im PAL SP-Modus.
2. Den Testknopf drücken, um auf den Prüfmodus umzuschalten.
3. Sicherstellen, daß Anzeige-Leuchtröhren aufleuchten.
4. Die Standbildtaste drücken und den aufgezeichneten Abschnitt im SP-Modus wiedergeben.
5. Die Spurlage mit der Spurreglertaste auf dem Gerät oder auf der Fernsteuerung einstellen. Dabei so vorgehen, daß die Bildstörungen ein Minimum erreichen.
6. Die Stopptaste drücken, um die im Standbild modus programmierten Daten zu speichern.
7. Die Gesamtlöschtaste drücken, um in den Normalmodus zurückzukehren.

▩ EINSTELLUNG DES Y/C-SCHALTKREISES

● Prüfpunkt-Diagramm

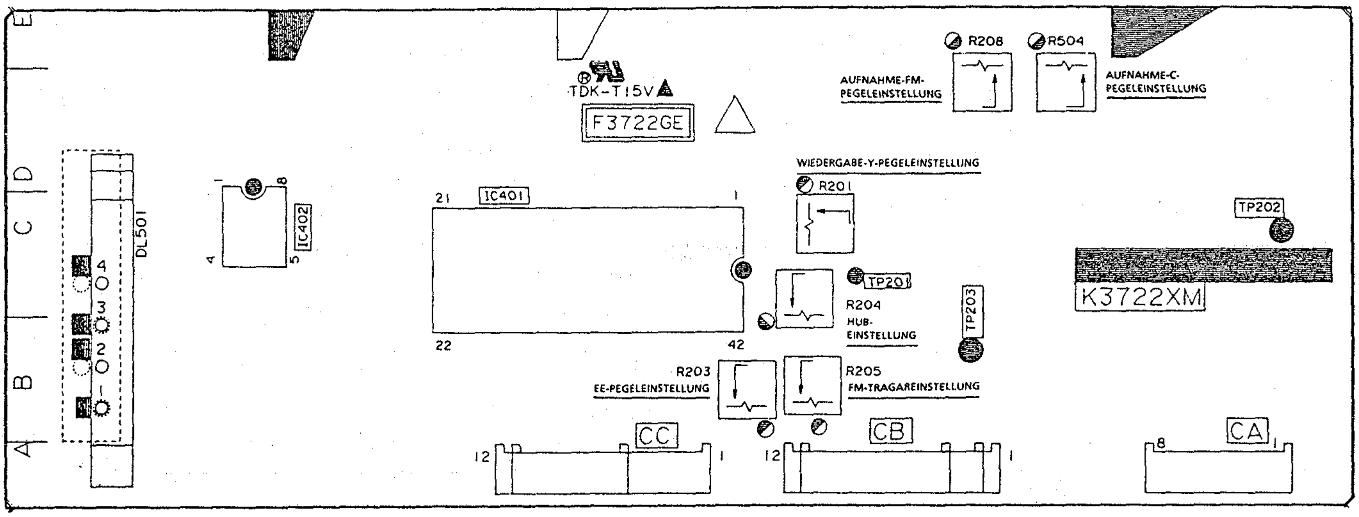

E
D
C
B
A
DL501
IC402
IC401
TDK-T15V
F3722GE
R208
R504
AUFNAHME-FM-PEGELEINSTELLUNG
AUFNAHME-C-PEGELEINSTELLUNG
WIEDERGABE-Y-PEGELEINSTELLUNG
R201
TP202
TP201
R204
HUB-EINSTELLUNG
TP203
K3722XM
R203
EE-PEGELEINSTELLUNG
R205
FM-TRAGAREINSTELLUNG
CC
CB
CA

Abbildung 2-4. Y/C-LEITERPLATTE

Einstellung des Elektrisch/Elektrisch-Pegels (EE)

Meßinstrument	Oszilloskop
Betriebsart	EE- oder Aufnahme
Eingangssignal	Standard-Farbbalken (treppenförmige Wellenform)
Prüfpunkt	Video-Ausgang
Einstellpunkt	R203 (EE-Pegelsteuerung)
Spezifikation	1,0 ± 0,06 Vs-s

1. Einen 75-Ohm-Widerstand am Video-Ausgang anschließen und die Oszilloskop-Prüfkabel parallel zum Widerstand anlegen. (Siehe nachfolgenden Hinweis.)
2. Das Farbbalkensignal im EE- oder Aufnahmemodus dem Video-Eingang zuführen.
3. R203 so einstellen, daß die Signalamplitude wie in Abbildung 2-5 einen Wert von 1,0 Vs-s aufweist.

Hinweis:
Wenn kein Abschlußwiderstand vorhanden ist, wird die Signalamplitude verdoppelt.

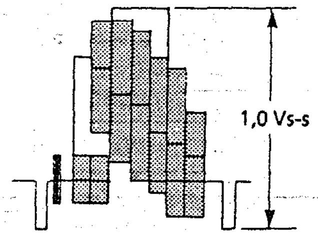


Abbildung 2-5.

Einstellung des Wiedergabe-Videosignalpegels

Meßinstrument	Oszilloskop
Betriebsart	Wiedergabe
Eingangssignal	Abgleichband (VROCPSV) (treppenför-mige Wellenform)
Prüfpunkt	Video-Ausgang-sanschluß
Einstellpunkt	R201 (Wiedergabeaussteuerung (Y-Pegel))
Spezifikation	1,0 ± 0,06 Vs-s

1. Einen 75-Ohm-Widerstand am Video-Ausgang anschließen und die Oszilloskop-Prüfkabel parallel zum Widerstand anlegen. (Siehe nachfolgenden Hinweis.)
2. Den Farbbalkenabschnitt des Abgleichbands wiedergeben und R201 so einstellen, daß die Signalamplitude wie in Abbildung 2-6 als 1,0 Vs-s gemessen wird.

Hinweis:
Wenn kein Abschlußwiderstand vorhanden ist, wird die Signalamplitude verdoppelt.

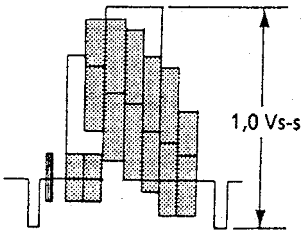


Abbildung 2-6.

Einstellung von FM-Frequenzträgersignal und Abweichung

Meßinstrument	Frequenzzähler, Oszilloskop
Betriebsart	Aufnahme/Wiedergabe (LP-Modus)
Eingangssignal	Standard-Farbbalken (treppenförmige Wellenform)
Prüfpunkt	TP301 (Masse an TP302) Video-Ausgangsanschluß
Einstellpunkt	R205 (FM-Trägersignalregler) R204 (Frequenzhubregler)
Spezifikation	3,8 ± 0,05 MHz 1,0 ± 0,04 Vs-s

1. Sicherstellen, daß R203 (EE-Pegel) und R201 (Y-Wiedergabepegel) richtig eingestellt wurden.
2. Einen 75-Ohm-Widerstand am Video-Ausgang anschließen und die Oszilloskopprüfkabel parallel zum Widerstand anlegen.
3. Den Frequenzzähler an TP301 und TP302 anlegen.
4. Das Gerät in den Aufnahmemodus bringen und für externe Eingabe ohne Signal vorbereiten. (Alle Kabel vom Video-Eingangsanschluß abklemmen.)
5. Den Prüfpunkt R205 so einstellen, daß die Zählerablesung 3,8 MHz ergibt.
6. Das Standard-Farbbalkensignal (treppenförmige Wellen-form) zuführen und eine Selbstaufzeichnung sowie Wiedergabe durchführen.
7. Die Video-Ausgangsanschlußspannung (am Anschlußwiderstand) auf dem Oszilloskop beobachten. Wenn der Wiedergabe-Video-Signalpegel über 1,0 Vs-s liegt, den Regler R204 im Uhrzeigersinn drehen. Liegt der Wert unter 1,0 Vs-s, ist der Regler gegen den Uhrzeigersinn zu verstellen. Denach eine Selbstaufzeichnung durchführen und das Band erneut wiedergeben.
8. Den obigen Schritt 7 wiederholen, um den Wiedergabe-Video-Signalpegel schließlich auf 1,0 ± 0,04 Vs-s (siehe Abb. 2-7) einzustellen.

Hinweis:
1. Diese Einstellung nur dann durchführen, wenn der IC401 ausgewechselt wurde, oder wenn die Trägersignal- (3,8 MHz) bzw. die Frequenzhub-Einstellung außerhalb des Sollwerts befinden.
2. Wenn kein Abschlußwiderstand vorhanden ist, wird die Signalamplitude verdoppelt.

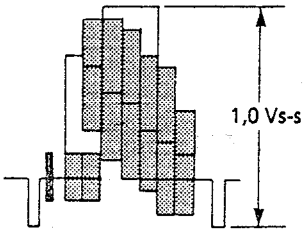
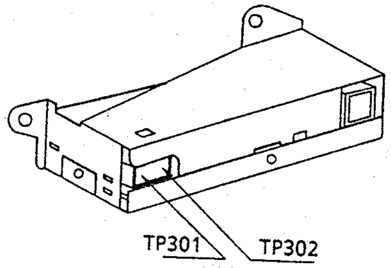


Abbildung 2-7.

Einstellung des Aufnahmestroms

Meßinstrument	Oszilloskop
Betriebsart	Aufnahme (LP-Modus)
Eingangssignal	Standard-Farbbalken (treppenförmige Wellenform)
Prüfpunkt	TP301, TP302 (Masse) [Externes Triggersignal; Video-Ausgangsanschluß]
Einstellpunkt	R504 (Aufnahme-Farbsättigungsregler) R208 (Aufnahme-FM-Regler)
Spezifikation	22 ± 2mVs-s (Chroma) 80 ± 10mVs-s (FM-Y)

1. Das Standard-Farbbalkensignal (treppenförmige Wellenform) in die Video-Eingangsklemme zuführen.
2. Die Erdungs-und Signalkabel des Oszilloskops an den Prüfpunkten TP302 und TP301 anlegen. (QCNW-6443GEZZ verwenden, um den Oszilloskop einfach anzuschließen.)
3. Das Gerät auf LP-Aufnahme schalten.
4. R208 einstellen, um das FM-Luminanzsignal zu verringern.
5. R504 so einstellen, daß die Amplitude des roten Abschnitts wie in Abbildung 2-8 einem Wert von 22 ± 2 mVs-s entspricht.
6. R208 so einstellen, daß der Synchronsppitzenteil der Amplitude 80 ± 10 mVs-s beträgt (siehe Abbildung 2-9).
7. QCNW-6443GEZZ nach der Einstellung entfernen. (Ebenfalls die Anschlußsonden von TP301 und TP302 entfernen.)


TP301
TP302

Hinweis:
TP301 und TP302 befinden sich am Kopfverstärkermodul.

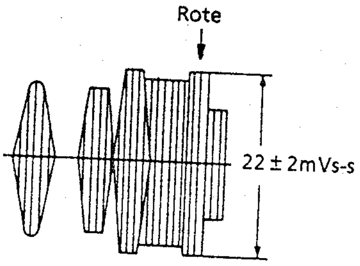


Abbildung 2-8.

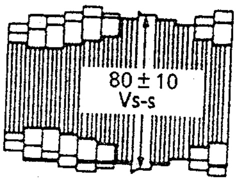


Abbildung 2-9.

EINSTELLUNG DER AUTOMATISCHEN BILDREGELUNG

- **Prüfpunkt-Diagramm**

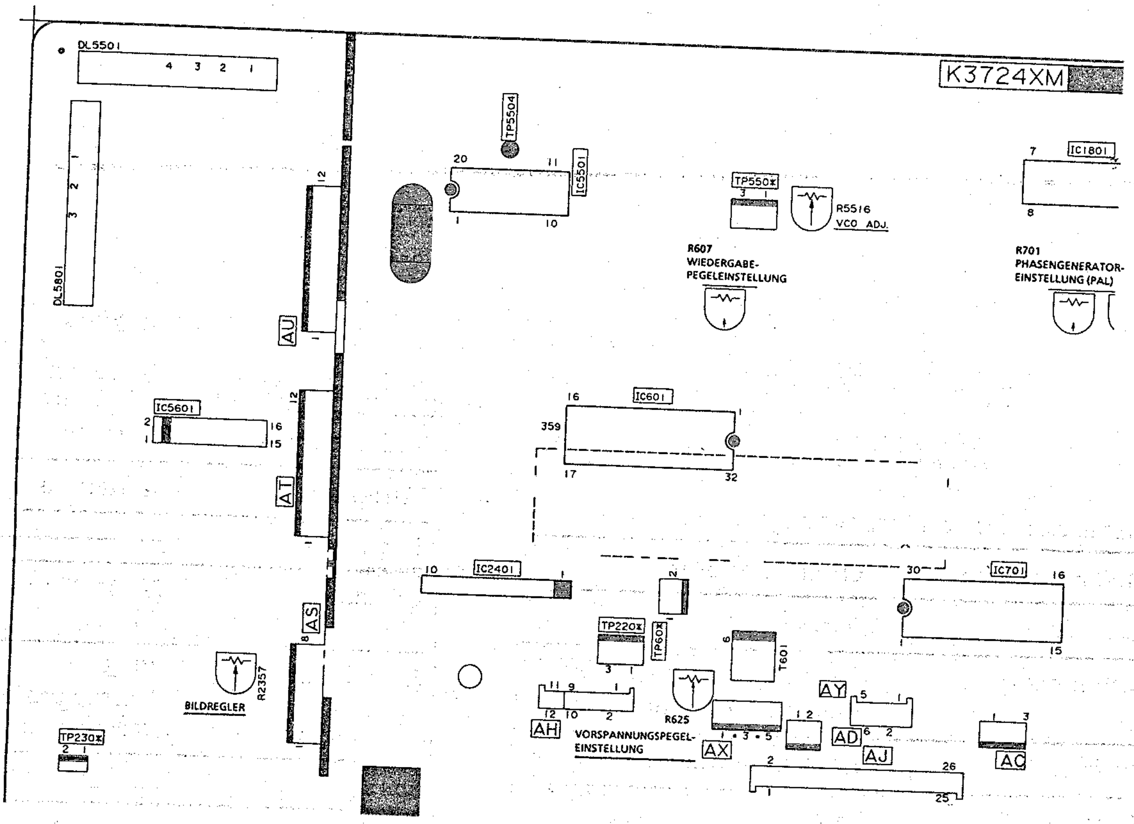

DL5501
4 3 2 1
DL5801
1 2 3
K3724XM
TP5504
20
11
1
10
IC5501
TP550✱
3 1
R5516
VCO ADJ.
IC1801
7
8
R607
WIEDERGABE-PEGELEINSTELLUNG
R701
PHASENGENERATOR-EINSTELLUNG (PAL)
AU
12
AT
IC5601
2
1
16
15
IC601
16
359
1
17
32
IC2401
10
AS
8
IC701
30
16
15
TP220✱
3 1
TP60✱
T601
6
R2357
BILDREGLER
TP230✱
2 1
11 9 1
12 10 2
AH
R625
VORSPANNUNGSPEGEL-EINSTELLUNG
AX
1 3 5
1 2
AY
5 1
AD
6 2
AJ
2
26
1
25
1 3
AC

Abbildung 2-10. HAUPTLEITERPLATTE

Einstellung der automatischen Bildregelung

Meßinstrument	Digital-Voltmeter
Betriebsart	Aufnahme und Wiedergabe auf selbstaufgezeichnetem Band. (SP-Modus)
Eingangssignal	Standard-Farbbalken (treppenförmige Wellenform)
Prüfpunkt	TP2301 (Signal), TP2302 (Masse)
Einstellpunkt	R2357 (Bildregler)
Spezifikation	2,5 ± 0,1 V

1. Wiedergabe der Eigenaufnahme (Farbbalkensignal).
2. Den Schalter der automatischen Bildregelung auf "ON" oder "AUTO" stellen und den Farbtonregler in die Mittelposition bringen.
3. Das Digital-Voltmeter an TP2301 (Signal) und TP2302 (Masse) anschließen.
   R2357 so einstellen, daß das Digital-Voltmeter 2,5 ± 0,1 V anzeigt.

EINSTELLUNG DES TONSCHALTKREISES

- **Prüfpunkt-Diagramm**

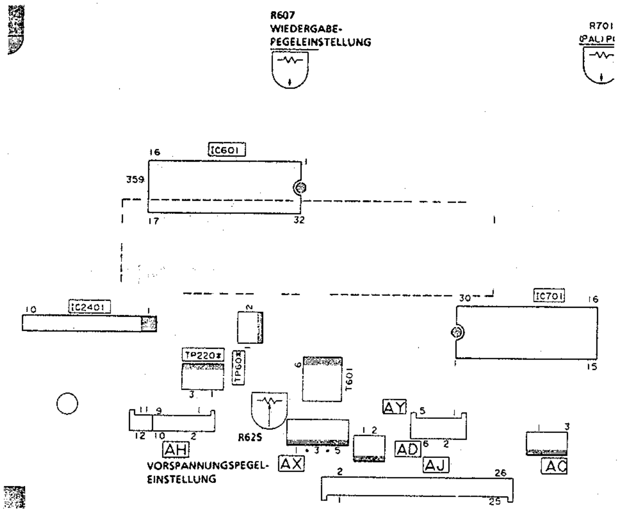


Abbildung 2-11. TON-LEITERPLATTE

Einstellung des Wiedergabepegels

Meßinstrument	Röhrenvoltmeter
Betriebsart	Wiedergabe
Eingangssignal	Abgleichband (VROCPSV) (Steuerpegelsignal 1 kHz)
Prüfpunkt	Ton-Ausgangsanschluß
Einstellpunkt	R607 (Wiedergabepegelregler)
Spezifikation	−9 ± 1 dBs

1. Das Abgleichband (Steuerpegelsignal 1 kHz) wiedergeben.
2. Das Röhrenvoltmeter am Ton-Ausgangsanschluß anschließen.
3. Den R607 (Wiedergabepegelregler) so einstellen, daß der Ausgangspegel bei −9 ± 1 dBs liegt.

Überprüfung der Loschspannung und der Schwingungszahl

Meßinstrument	Oszilloskop
Betriebsart	Aufnahme
Eingangssignal	————————
Prüfpunkt	Beide Enden des Vollöschkopfs
Einstellpunkt	————————
Spezifikation	Löschspannung: über 40 Vs-s Schwingungszahl: 70 ± 5 kHz

1. Das Gerät in die Aufnahme-Betriebsart schalten.
2. Das Oszilloskop an beide Enden des Vollöschkopfes anschließen.
3. Sicherstellen, daß die Löschspannung über 40 Vs-s liegt.
4. Die Schwingungszahl muß bei 70 ± 5 kHz liegen.

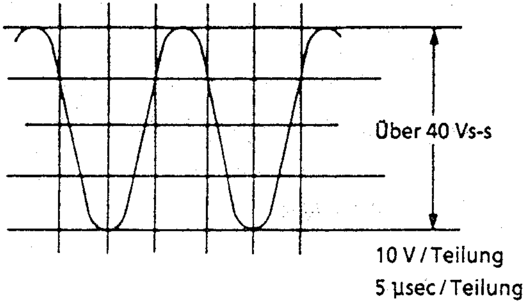


Abbildung 2-12.

Einstellung des Vormagnetisierungsstroms

Meßinstrument	Röhrenvoltmeter
Betriebsart	Aufnahme
Eingangssignal	————————
Prüfpunkt	TP601 (Signalmasse), TP602 (Masse)
Einstellpunkt	R625 (Vormagnetisierungsstromregler)
Spezifikation	280 ± 10 µA

1. Das Gerät in die Aufnahme-Betriebsart schalten.
2. Das Röhrenvoltmeter an TP601 (Signalkabel) und TP602 (Erdungskabel) anschließen.

3. Den R625 (Vorspannungsstromregler) so einstellen, daß der Vorspannungsstrom 280 ± 10 µA (2,8 ± 0,1 mV) beträgt.

Überprüfung des Aufnahmepegels

Meßinstrument	Röhrenvoltmeter
Betriebsart	Selbstaufzeichnung/Wiedergabe
Eingangssignal	1 kHz/ – 3,8 dBs
Prüfpunkt	Ton-Ausgangsanschluß
Einstellpunkt	————————
Spezifikation	1kHz – 3,8 ± 3 dBs

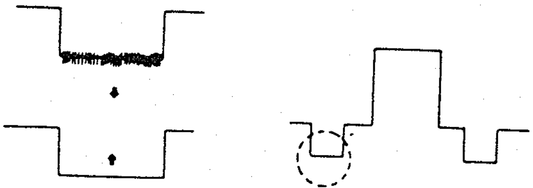
1. Das Signal (1 kHz, – 3,8 dBs) dem Ton-Eingangsanschluß zuführen. Eine Selbstaufzeichnung sowie Wiedergabe des Signals durchführen.
2. Sicherstellen, daß am Ton-Ausgangsanschluß 1kHz – 3,8 ± 3 dBs vorliegen.
3. Wenn die Werte außerhalb des Sollwerts liegen, den Wiedergabepegel und den Vormagnetisierungsstrom erneut einstellen.

■ EINSTELLUNG DES ZWISCHENFREQUENZSCHALTKREISES (ZF)

Einstellung der automatischen Verstärkungsregelung (AVR)

Meßinstrument	Oszilloskop Signalgenerator
Betriebsart	Elektrisch/Elektrisch
Eingangssignal	Farbbalkensignal
Prüfpunkt	TP1551 (Masse) TP1552 (Video-Ausgang)
Einstellpunkt	VR001 (Automatischer Verstärkungsregler)

1. Das Farbbalkensignal (Eingangsfeldstärke: 80 dBµ) empfangen.
2. Die Sonde des Oszilloskops an den Video-Ausgangsanschluß anschließen. VR001 (Automatischer Verstärkungsregler) so einstellen, daß die Spitze des Horizontalsynchronisierimpulses nicht gestört ist.



Genau vor der Schrumpfung

Abbildung 2-13.

Einstellung der automatischen Feinabstimung (AFT)

Meßinstrument	Oszilloskop Signalgenerator
Betriebsart	Elektrisch/Elektrisch
Eingangssignal	Bild-ZF "Uni-Welle" Farbbalkensignal (70 dBµ)
Prüfpunkt	TP1551 (Masse) TP1552 (Video-Ausgang)
Einstellpunkt	T002 (Feinabstimmautomatikspule)
Spezifikation	————————

1. Das Farbbalkensignal (Eingangsfeldstärke: 70 dBµ) empfangen.
2. Mit dem Signalgenerator das Bild-ZF-Signal (38,9 MHz) (Sinuswelle) dem ZF-Ausgangsanschluß des Tuners zuführen.
3. Den Abstimmschalter auf VHF oder UHF stellen. Die Abstimmtaste (+) oder (–) gedrückt halten, bis die Überlagerung am Oszilloskop-Bildschirm dem Minimalwert entspricht.
4. Den Abstimmschalter in die Normalposition bringen. T002 (Feinabstimmautomatikspule) so einstellen, daß die Überlagerung am Oszilloskop-Bildschirm dem Minimalwert entspricht.

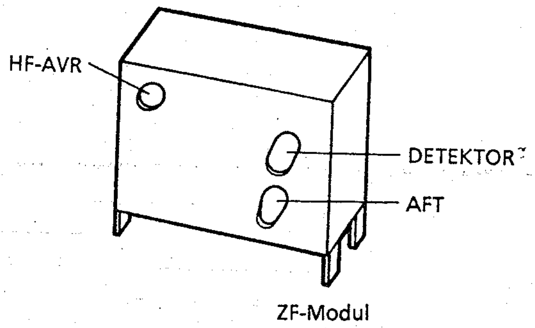


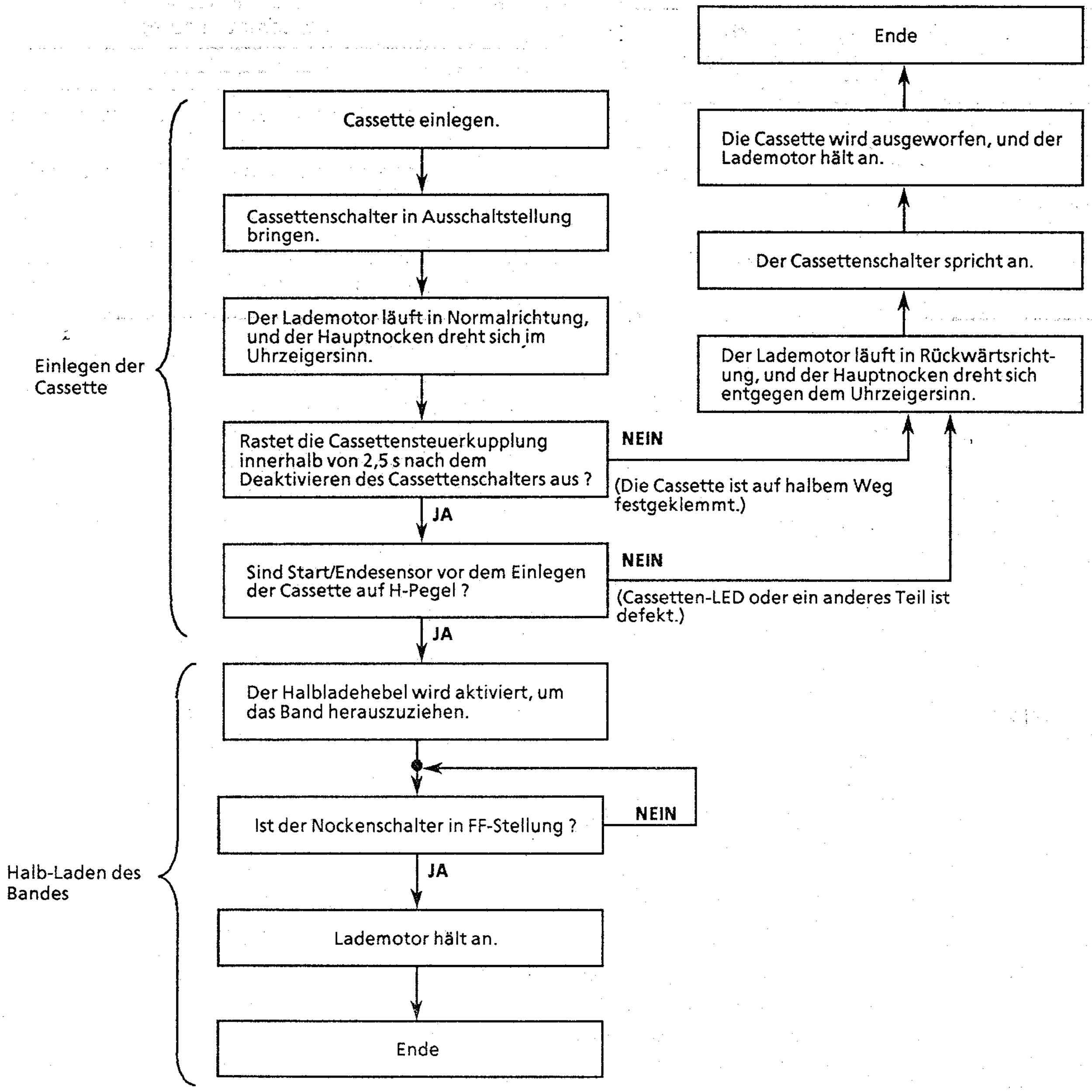
Abbildung 2-14.

MECHANISMUSBEDIENUNGS-ABLAUFPLAN UND FEHLERSUCHTABELLE

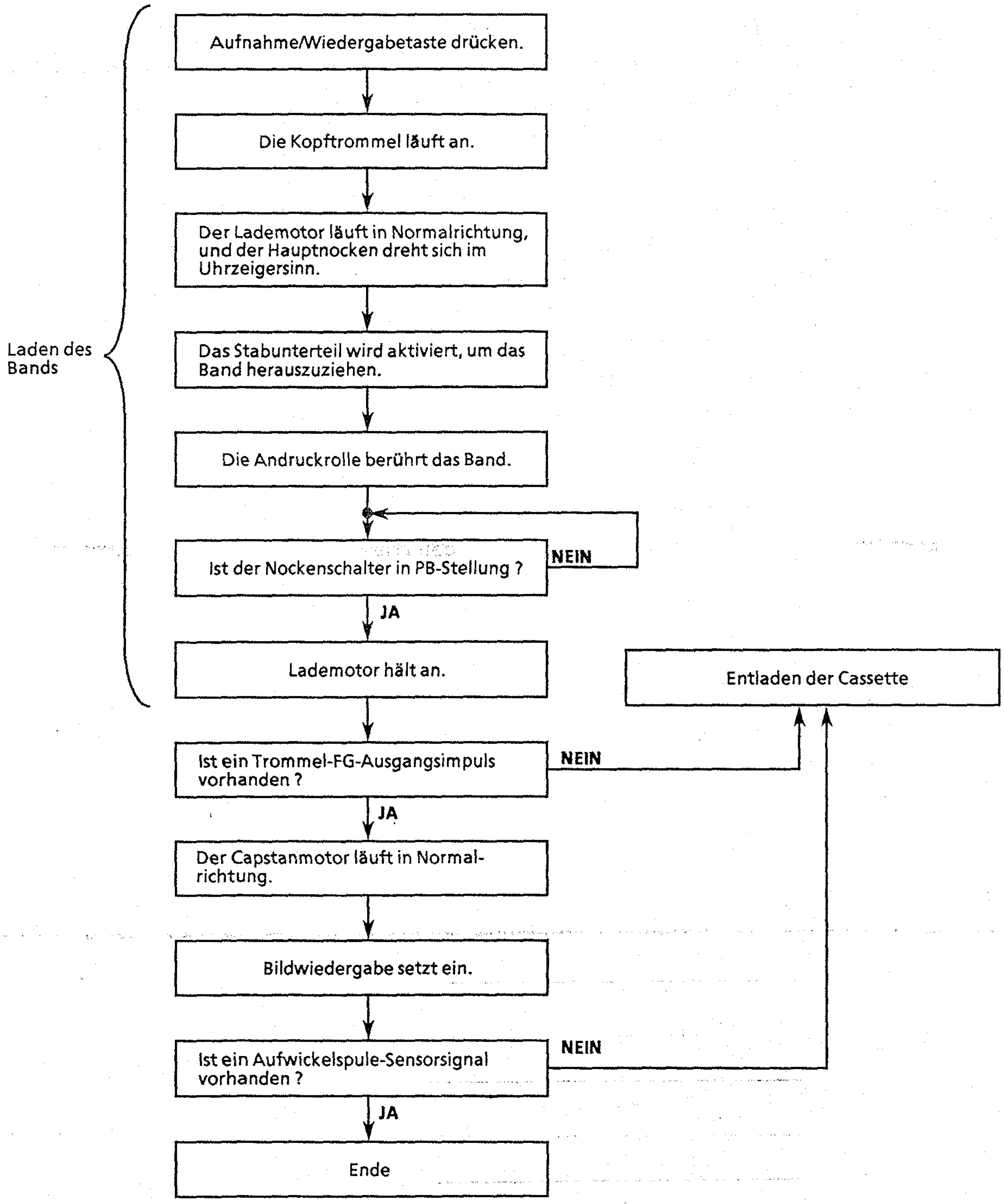
ARBEITSWEISE DES LAUFWERKS, ABLAUFPLAN

- * Dieser Ablaufplan beschreibt die Arbeitsweise des Laufwerks in groben Zügen ohne Angabe von Details.
- * Zur Stellung des Nockenschalters siehe Abb. 3-2.

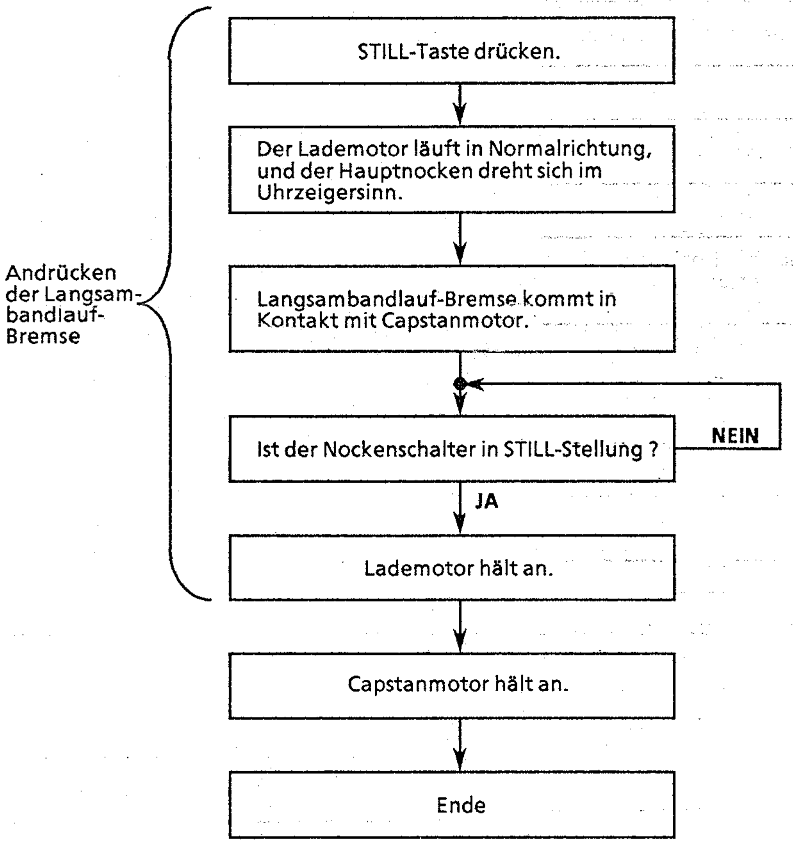
EINLEGEN DER CASSETTE→STOPP


Einlegen der Cassette
Cassette einlegen.
Cassettenschalter in Ausschaltstellung bringen.
Der Lademotor läuft in Normalrichtung, und der Hauptnocken dreht sich im Uhrzeigersinn.
Rastet die Cassettensteuerkupplung innerhalb von 2,5 s nach dem Deaktivieren des Cassettenschalters aus ?
NEIN
(Die Cassette ist auf halbem Weg festgeklemmt.)
JA
Sind Start/Endesensor vor dem Einlegen der Cassette auf H-Pegel ?
NEIN
(Cassetten-LED oder ein anderes Teil ist defekt.)
JA
Der Lademotor läuft in Rückwärtsrichtung, und der Hauptnocken dreht sich entgegen dem Uhrzeigersinn.
Der Cassettenschalter spricht an.
Die Cassette wird ausgeworfen, und der Lademotor hält an.
Ende
Halb-Laden des Bandes
Der Halbladehebel wird aktiviert, um das Band herauszuziehen.
Ist der Nockenschalter in FF-Stellung ?
NEIN
JA
Lademotor hält an.
Ende

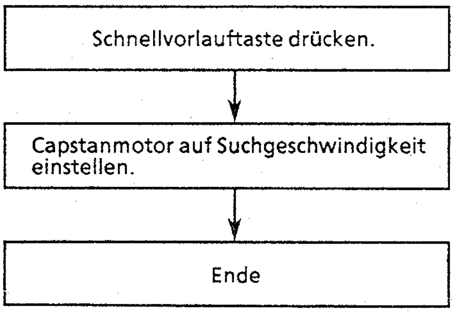
STOPP→ AUFNAHME/WIEDERGABE


Aufnahme/Wiedergabetaste drücken.
Die Kopftrommel läuft an.
Der Lademotor läuft in Normalrichtung, und der Hauptnocken dreht sich im Uhrzeigersinn.
Das Stabunterteil wird aktiviert, um das Band herauszuziehen.
Die Andruckrolle berührt das Band.
Ist der Nockenschalter in PB-Stellung ?
NEIN
JA
Lademotor hält an.
Laden des Bands
Entladen der Cassette
Ist ein Trommel-FG-Ausgangsimpuls vorhanden ?
NEIN
JA
Der Capstanmotor läuft in Normalrichtung.
Bildwiedergabe setzt ein.
Ist ein Aufwickelspule-Sensorsignal vorhanden ?
NEIN
JA
Ende

WIEDERGABE→STANDBILDWIEDERGABE

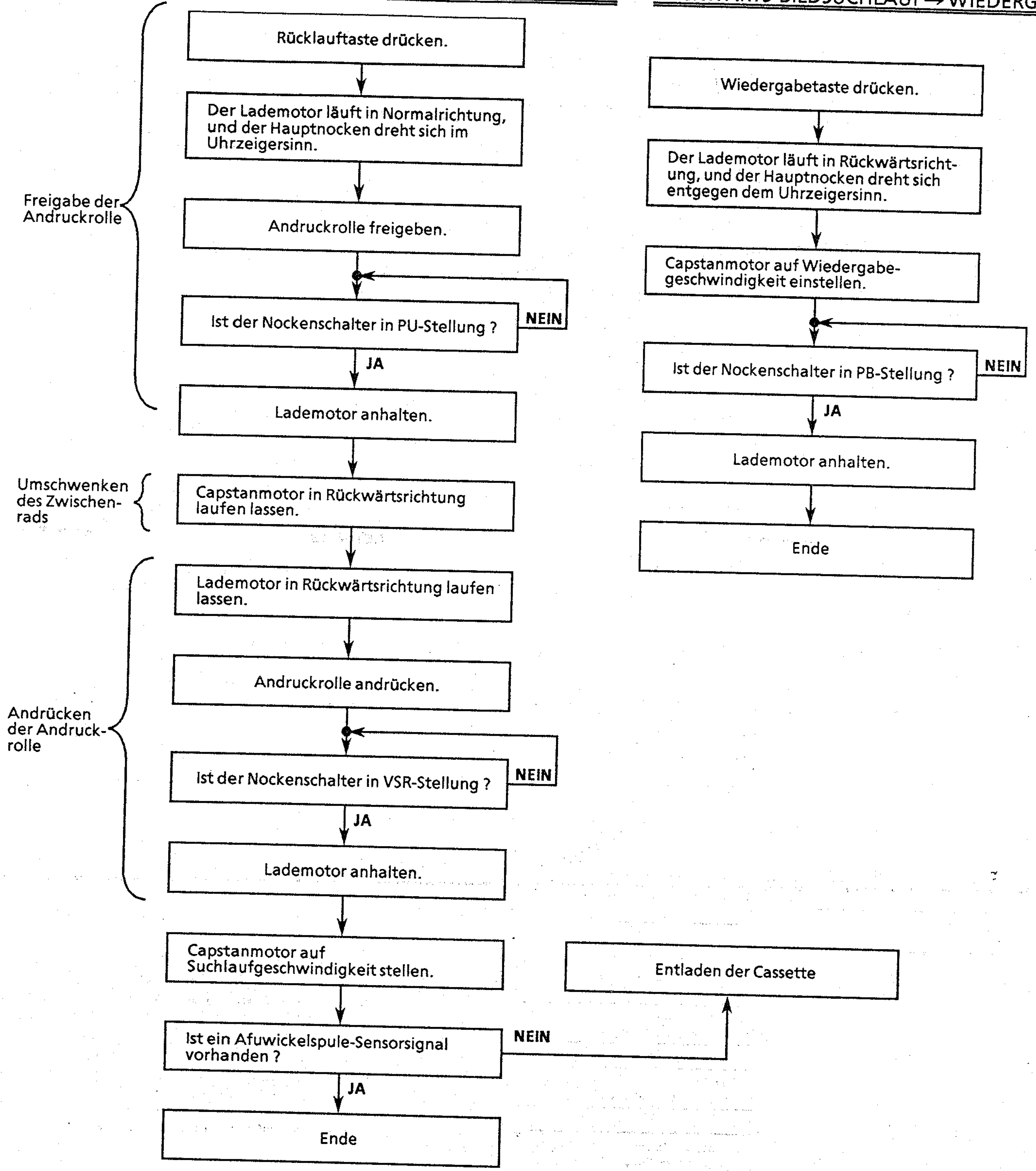

STILL-Taste drücken.
Der Lademotor läuft in Normalrichtung, und der Hauptnocken dreht sich im Uhrzeigersinn.
Andrücken der Langsambandlauf-Bremse
Langsambandlauf-Bremse kommt in Kontakt mit Capstanmotor.
Ist der Nockenschalter in STILL-Stellung ?
NEIN
JA
Lademotor hält an.
Capstanmotor hält an.
Ende

WIEDERGABE→VORWÄRTS-BILDSUCHLAUF

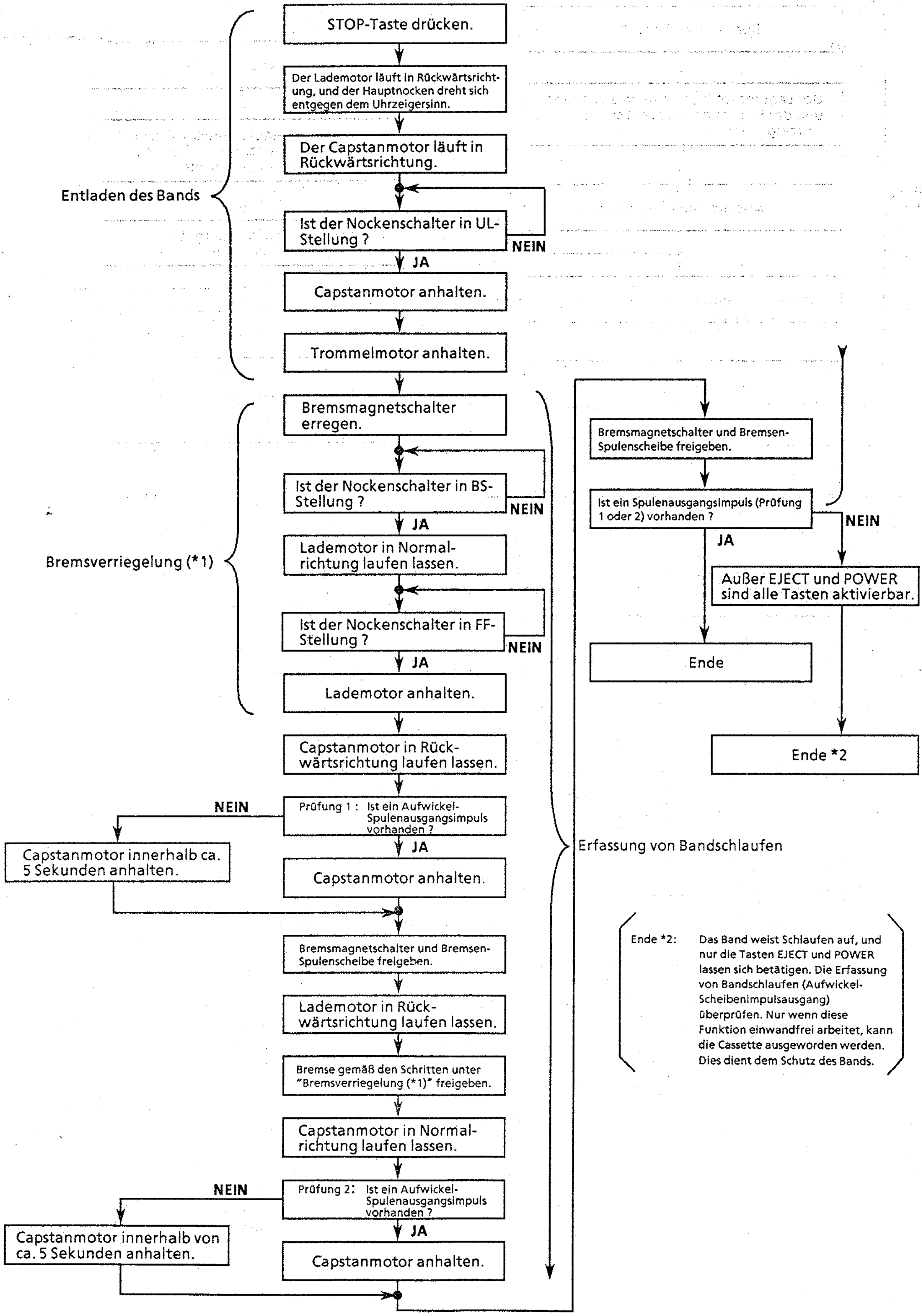

Schnellvorlauftaste drücken.
Capstanmotor auf Suchgeschwindigkeit einstellen.
Ende

WIEDERGABE→ RÜCKWÄRTS-BILDSUCHLAUF

RÜCKWÄRTS-BILDSUCHLAUF→ WIEDERGABE


Freigabe der Andruckrolle
Rücklauftaste drücken.
Der Lademotor läuft in Normalrichtung, und der Hauptnocken dreht sich im Uhrzeigersinn.
Andruckrolle freigeben.
Ist der Nockenschalter in PU-Stellung ?
NEIN
JA
Lademotor anhalten.
Umschwenken des Zwischenrads
Capstanmotor in Rückwärtsrichtung laufen lassen.
Andrücken der Andruckrolle
Lademotor in Rückwärtsrichtung laufen lassen.
Andruckrolle andrücken.
Ist der Nockenschalter in VSR-Stellung ?
NEIN
JA
Lademotor anhalten.
Capstanmotor auf Suchlaufgeschwindigkeit stellen.
Ist ein Afuwickelspule-Sensorsignal vorhanden ?
NEIN
Entladen der Cassette
JA
Ende
Wiedergabetaste drücken.
Der Lademotor läuft in Rückwärtsrichtung, und der Hauptnocken dreht sich entgegen dem Uhrzeigersinn.
Capstanmotor auf Wiedergabegeschwindigkeit einstellen.
Ist der Nockenschalter in PB-Stellung ?
NEIN
JA
Lademotor anhalten.
Ende

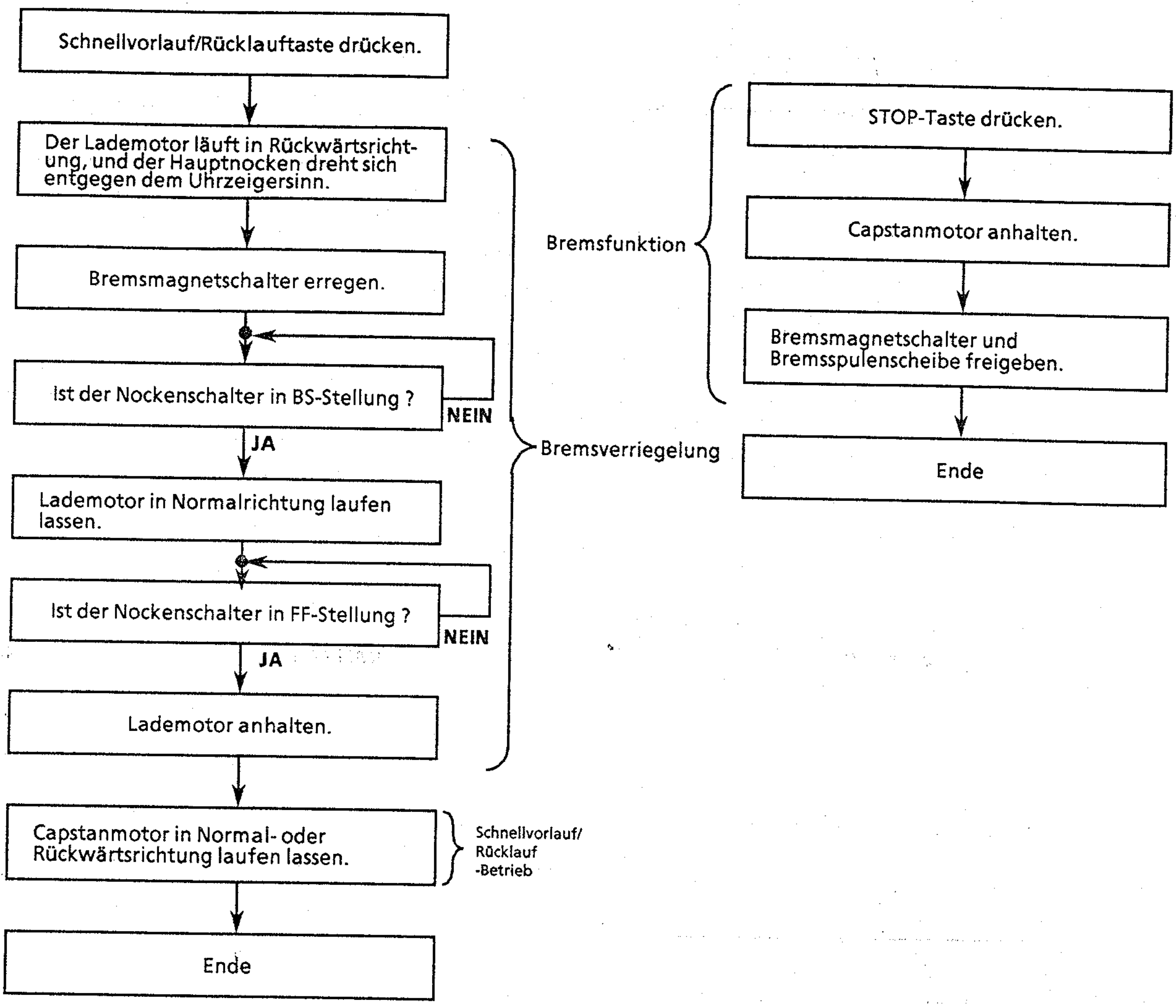
AUFNAHME/WIEDERGABE→STOPP


STOP-Taste drücken.
Der Lademotor läuft in Rückwärtsrichtung, und der Hauptnocken dreht sich entgegen dem Uhrzeigersinn.
Der Capstanmotor läuft in Rückwärtsrichtung.
Ist der Nockenschalter in UL-Stellung ?
NEIN
JA
Capstanmotor anhalten.
Trommelmotor anhalten.
Entladen des Bands
Bremsmagnetschalter erregen.
Ist der Nockenschalter in BS-Stellung ?
NEIN
JA
Lademotor in Normalrichtung laufen lassen.
Ist der Nockenschalter in FF-Stellung ?
NEIN
JA
Lademotor anhalten.
Bremsverriegelung (*1)
Capstanmotor in Rückwärtsrichtung laufen lassen.
Prüfung 1 : Ist ein Aufwickel-Spulenausgangsimpuls vorhanden ?
NEIN
JA
Capstanmotor innerhalb ca. 5 Sekunden anhalten.
Capstanmotor anhalten.
Bremsmagnetschalter und Bremsen-Spulenscheibe freigeben.
Lademotor in Rückwärtsrichtung laufen lassen.
Bremse gemäß den Schritten unter "Bremsverriegelung (*1)" freigeben.
Capstanmotor in Normalrichtung laufen lassen.
Prüfung 2: Ist ein Aufwickel-Spulenausgangsimpuls vorhanden ?
NEIN
JA
Capstanmotor innerhalb von ca. 5 Sekunden anhalten.
Capstanmotor anhalten.
Erfassung von Bandschlaufen
Bremsmagnetschalter und Bremsen-Spulenscheibe freigeben.
Ist ein Spulenausgangsimpuls (Prüfung 1 oder 2) vorhanden ?
NEIN
JA
Außer EJECT und POWER sind alle Tasten aktivierbar.
Ende
Ende *2

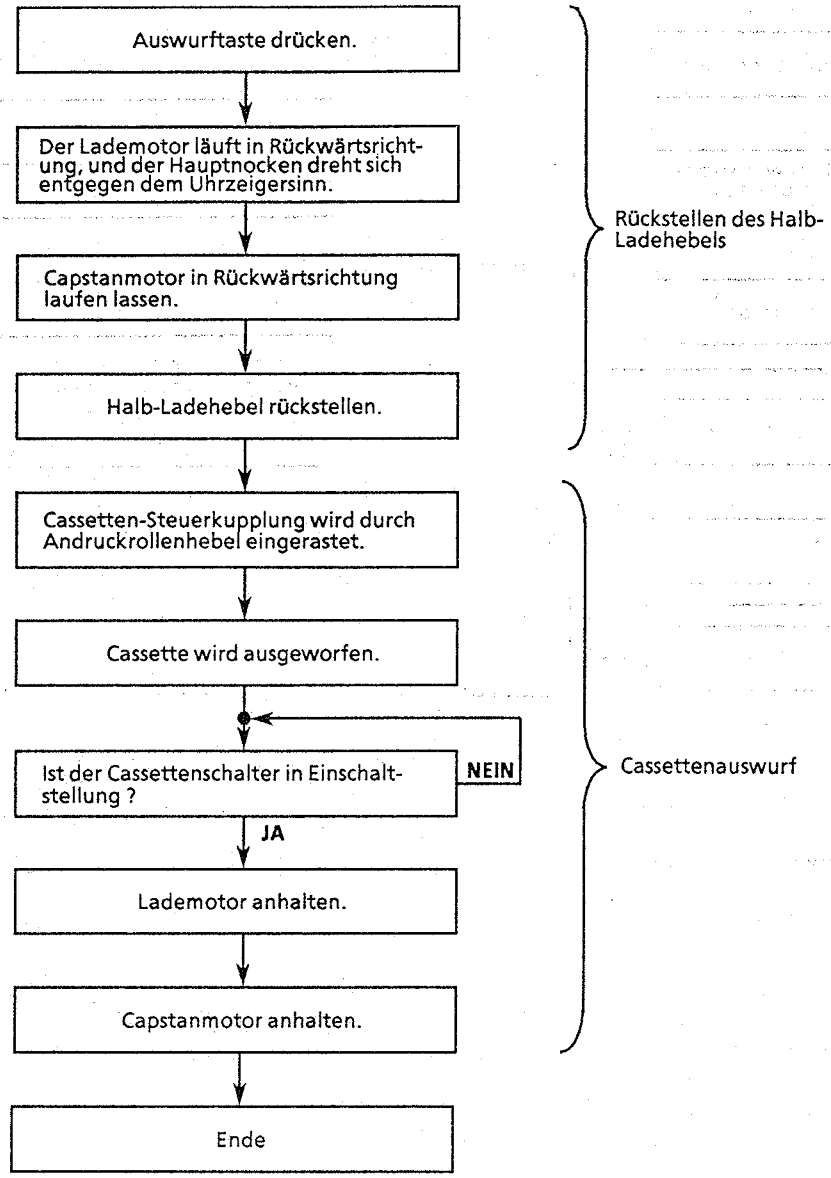
Ende *2: Das Band weist Schlaufen auf, und nur die Tasten EJECT und POWER lassen sich betätigen. Die Erfassung von Bandschlaufen (Aufwickel-Scheibenimpulsausgang) überprüfen. Nur wenn diese Funktion einwandfrei arbeitet, kann die Cassette ausgeworden werden. Dies dient dem Schutz des Bands.

STOPP→SCHNELLVORLAUF/RÜCKLAUF

SCHNELLVORLAUF/RÜCKLAUF→STOPP


Schnellvorlauf/Rücklauftaste drücken.
Der Lademotor läuft in Rückwärtsrichtung, und der Hauptnocken dreht sich entgegen dem Uhrzeigersinn.
Bremsmagnetschalter erregen.
Ist der Nockenschalter in BS-Stellung ?
NEIN
JA
Lademotor in Normalrichtung laufen lassen.
Ist der Nockenschalter in FF-Stellung ?
NEIN
JA
Lademotor anhalten.
Bremsverriegelung
Capstanmotor in Normal- oder Rückwärtsrichtung laufen lassen.
Schnellvorlauf/Rücklauf-Betrieb
Ende
STOP-Taste drücken.
Capstanmotor anhalten.
Bremsmagnetschalter und Bremsspulenscheibe freigeben.
Bremsfunktion
Ende

STOPP→ CASSETTENAUSWURF


Auswurftaste drücken.
Der Lademotor läuft in Rückwärtsrichtung, und der Hauptnocken dreht sich entgegen dem Uhrzeigersinn.
Capstanmotor in Rückwärtsrichtung laufen lassen.
Halb-Ladehebel rückstellen.
Rückstellen des Halb-Ladehebels
Cassetten-Steuerkupplung wird durch Andruckrollenhebel eingerastet.
Cassette wird ausgeworfen.
Ist der Cassettenschalter in Einschaltstellung ?
NEIN
JA
Lademotor anhalten.
Capstanmotor anhalten.
Cassettenauswurf
Ende

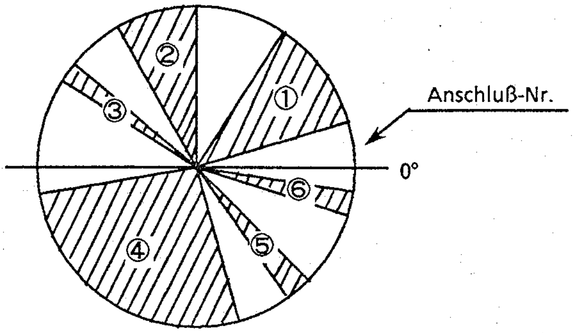

②
①
③
⑥
⑤
④
Anschluß-Nr.
0°

Abb. 3-1 Nockenschaltermuster

* Der Nockenschalter hat das in Abb. 3-1 gezeigte Muster. Die Schaltung wird aktiviert, wenn das Signal zu den schraffierten Bereichen des Schalters gelangt. Die Zustände der sechs Signalmuster werden von Systemsteuereinheit als Ein oder Aus interpretiert und auf diese Weise die Betriebsarten des Laufwerks festgestellt.

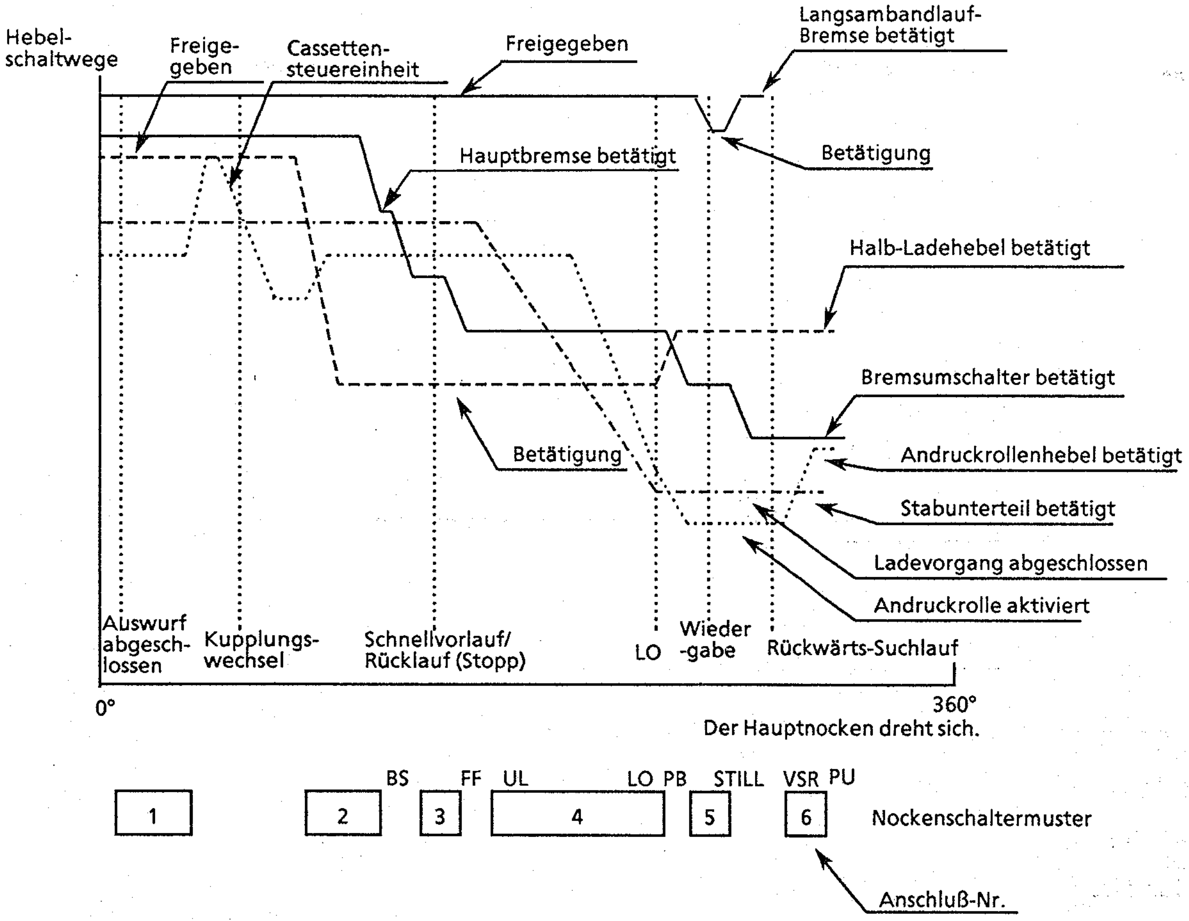
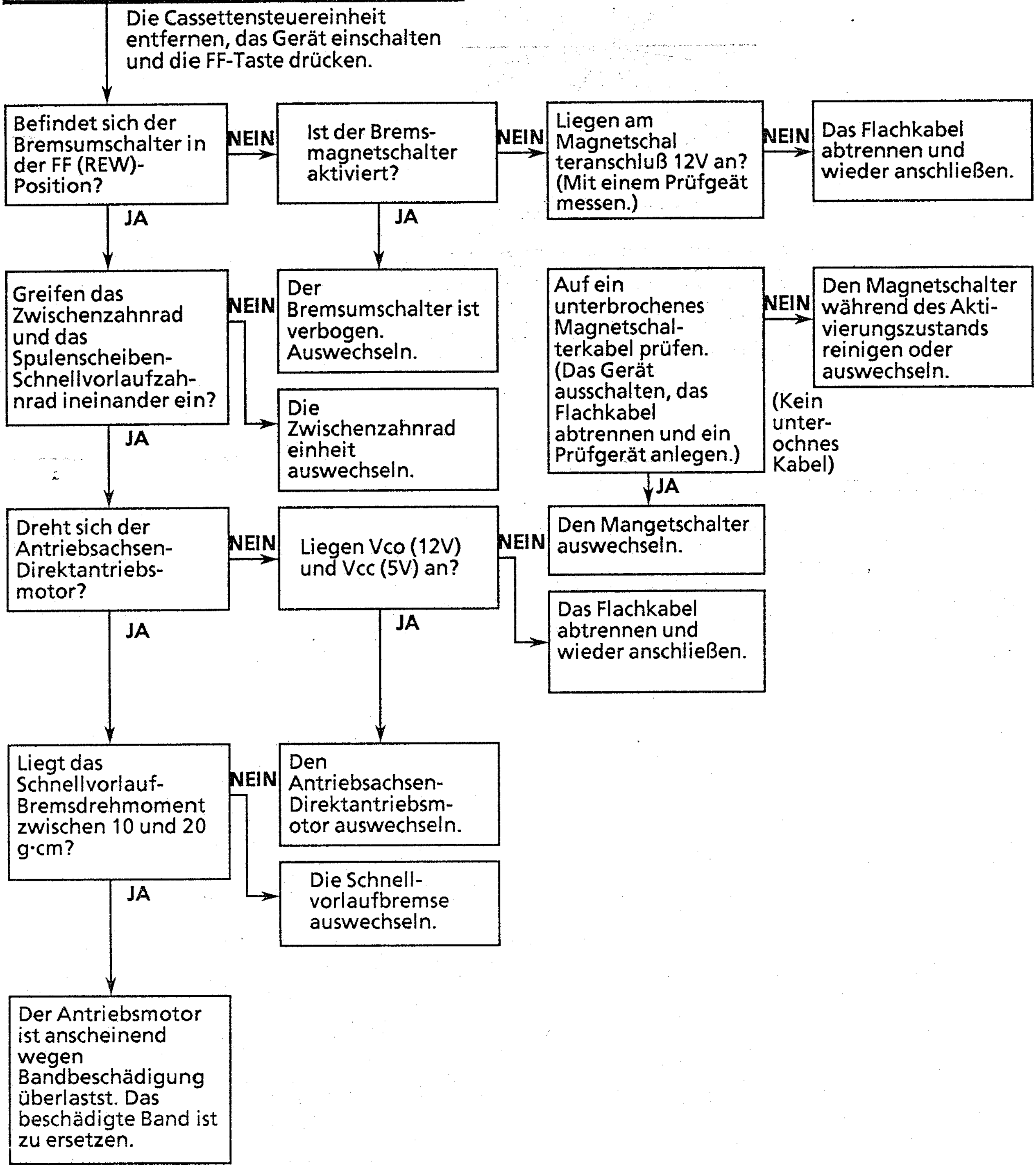

Hebel-schaltwege
Freige-geben
Cassetten-steuereinheit
Freigegeben
Langsambandlauf-Bremse betätigt
Hauptbremse betätigt
Betätigung
Halb-Ladehebel betätigt
Bremsumschalter betätigt
Betätigung
Andruckrollenhebel betätigt
Stabunterteil betätigt
Ladevorgang abgeschlossen
Andruckrolle aktiviert
Auswurf abgesch-lossen
Kupplungs-wechsel
Schnellvorlauf/Rücklauf (Stopp)
LO
Wieder-gabe
Rückwärts-Suchlauf
0°
360°
Der Hauptnocken dreht sich.
BS
FF
UL
LO
PB
STILL
VSR
PU
1
2
3
4
5
6
Nockenschaltermuster
Anschluß-Nr.

Abb. 3-2 Beziehung zwischen den Nockenschalterstellungen und den Laufwerkoperationen.

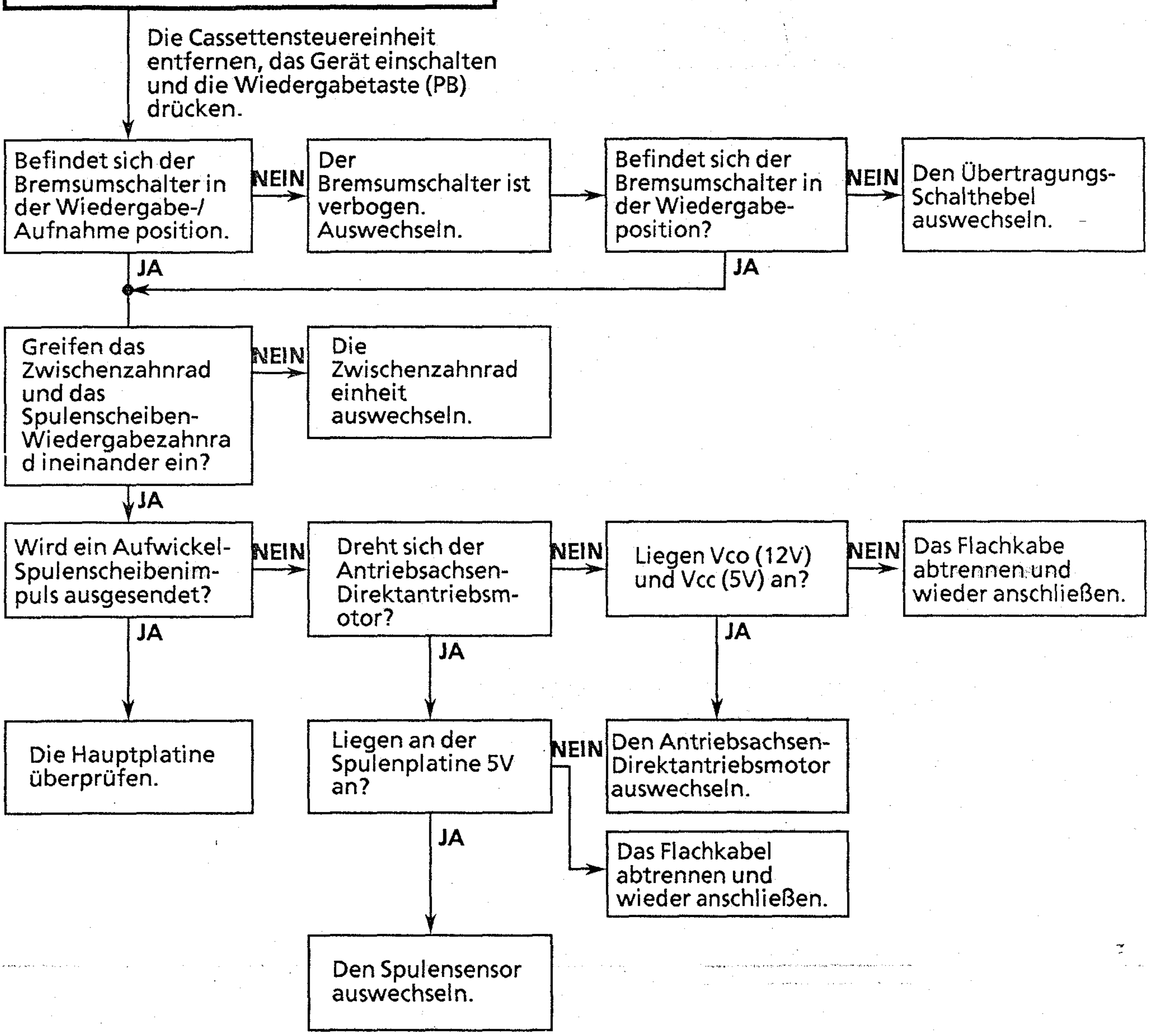
Die Beziehung zwischen den Nockenschalterstellungen und den Laufwerkoperationen ist in Abb. 3-2 dargestellt.

FEHLERSUCHE (LAUFWERK)

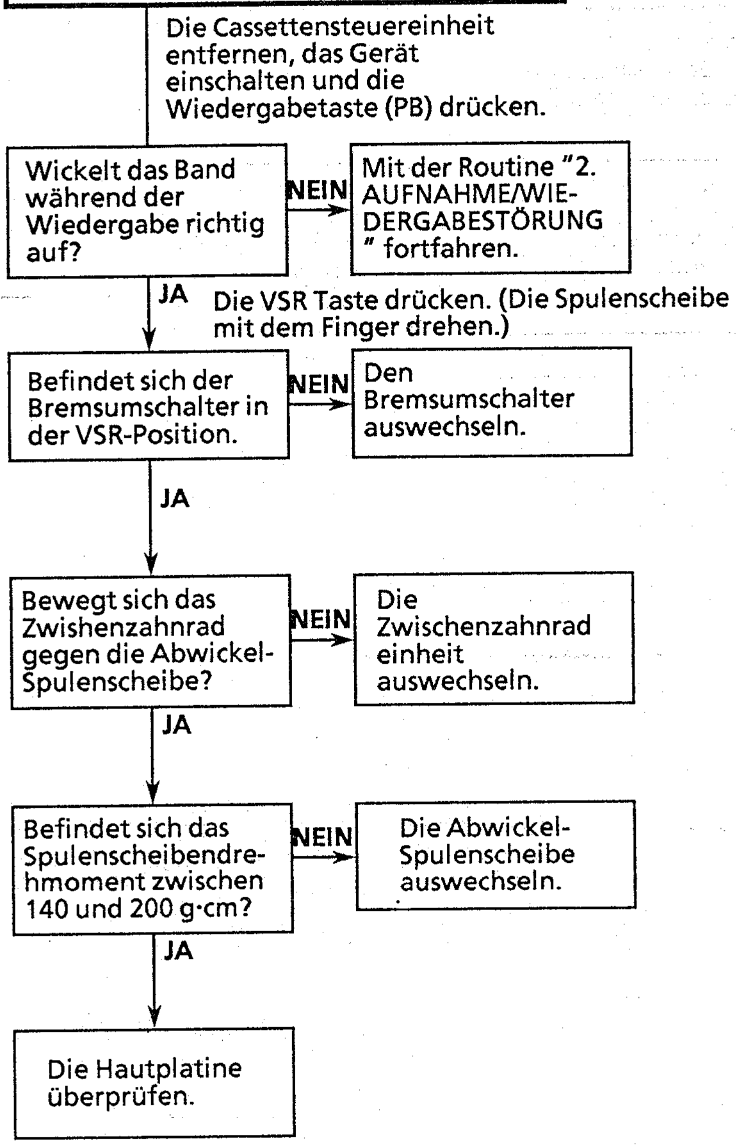
1. SCHNELLVORLAUF / RÜCKLAUFSTÖRUNG (KEINE BAND AUF-/ABWICKLUNG)


Die Cassettensteuereinheit entfernen, das Gerät einschalten und die FF-Taste drücken.
Befindet sich der Bremsumschalter in der FF (REW)-Position?
NEIN
Ist der Bremsmagnetschalter aktiviert?
NEIN
Liegen am Magnetschalteranschluß 12V an? (Mit einem Prüfgeät messen.)
NEIN
Das Flachkabel abtrennen und wieder anschließen.
JA
JA
Greifen das Zwischenzahnrad und das Spulenscheiben-Schnellvorlaufzahnrad ineinander ein?
NEIN
Der Bremsumschalter ist verbogen. Auswechseln.
Die Zwischenzahnrad einheit auswechseln.
Auf ein unterbrochenes Magnetschalterkabel prüfen. (Das Gerät ausschalten, das Flachkabel abtrennen und ein Prüfgerät anlegen.)
NEIN
Den Magnetschalter während des Aktivierungszustands reinigen oder auswechseln.
(Kein unterochnes Kabel)
JA
Den Mangetschalter auswechseln.
JA
Dreht sich der Antriebsachsen-Direktantriebsmotor?
NEIN
Liegen Vco (12V) und Vcc (5V) an?
NEIN
Das Flachkabel abtrennen und wieder anschließen.
JA
JA
Liegt das Schnellvorlauf-Bremsdrehmoment zwischen 10 und 20 g·cm?
NEIN
Den Antriebsachsen-Direktantriebsmotor auswechseln.
Die Schnellvorlaufbremse auswechseln.
JA
Der Antriebsmotor ist anscheinend wegen Bandbeschädigung überlastst. Das beschädigte Band ist zu ersetzen.

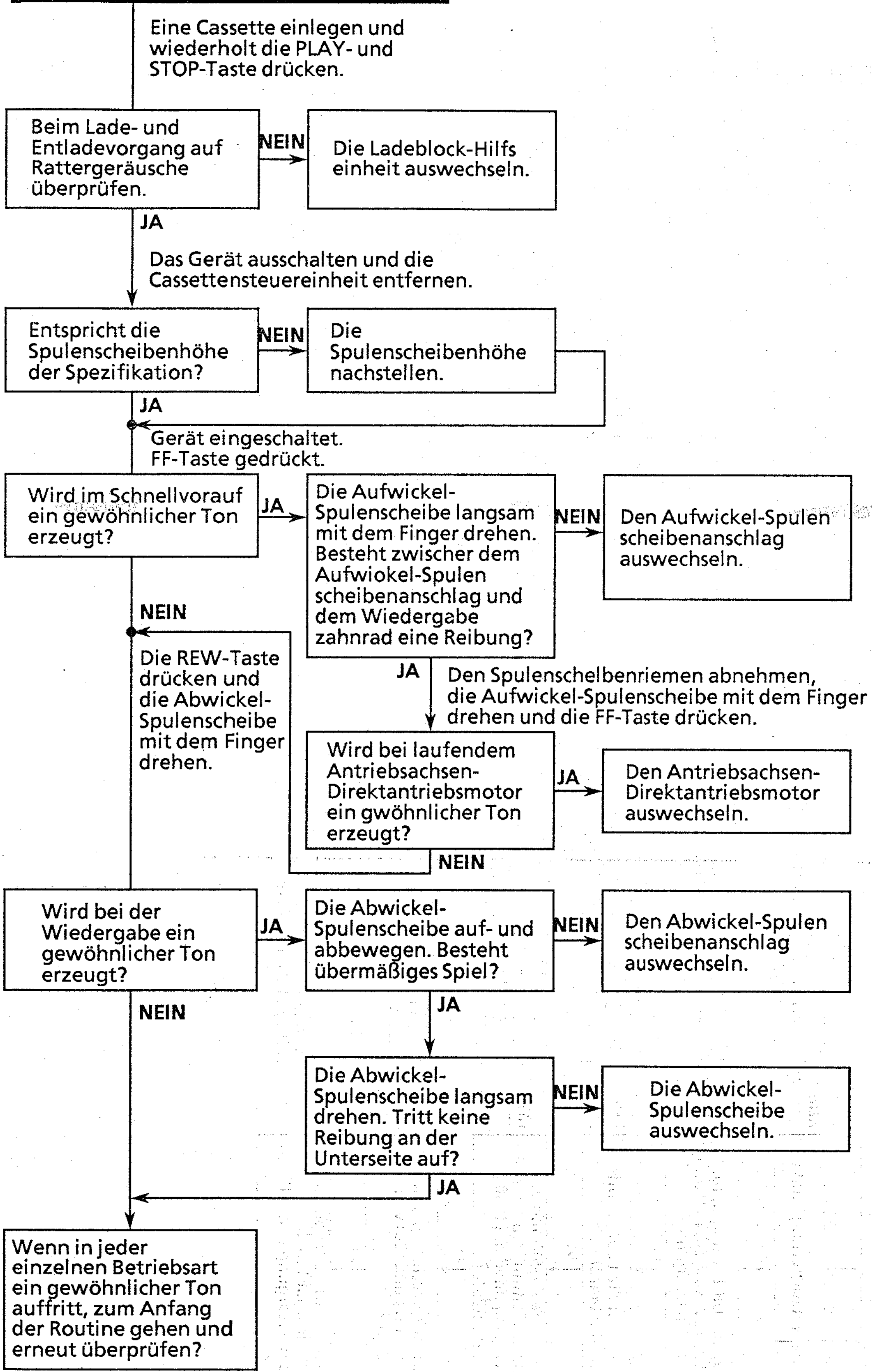
2. AUFNAHME-/WIEDERGABESTÖRUNG (FREIGABE DER BETRIEBSART)


Die Cassettensteuereinheit entfernen, das Gerät einschalten und die Wiedergabetaste (PB) drücken.
Befindet sich der Bremsumschalter in der Wiedergabe-/Aufnahme position.
NEIN
Der Bremsumschalter ist verbogen. Auswechseln.
Befindet sich der Bremsumschalter in der Wiedergabe-position?
NEIN
Den Übertragungs-Schalthebel auswechseln.
JA
JA
Greifen das Zwischenzahnrad und das Spulenscheiben-Wiedergabezahnrad ineinander ein?
NEIN
Die Zwischenzahnrad einheit auswechseln.
JA
Wird ein Aufwickel-Spulenscheibenimpuls ausgesendet?
NEIN
Dreht sich der Antriebsachsen-Direktantriebsmotor?
NEIN
Liegen Vco (12V) und Vcc (5V) an?
NEIN
Das Flachkabe abtrennen und wieder anschließen.
JA
JA
JA
Die Hauptplatine überprüfen.
Liegen an der Spulenplatine 5V an?
NEIN
Den Antriebsachsen-Direktantriebsmotor auswechseln.
Das Flachkabel abtrennen und wieder anschließen.
JA
Den Spulensensor auswechseln.

3. AUFWICKELSTÖRUNG BEI RÜCKWÄRTS-BILDSUCHLAUF

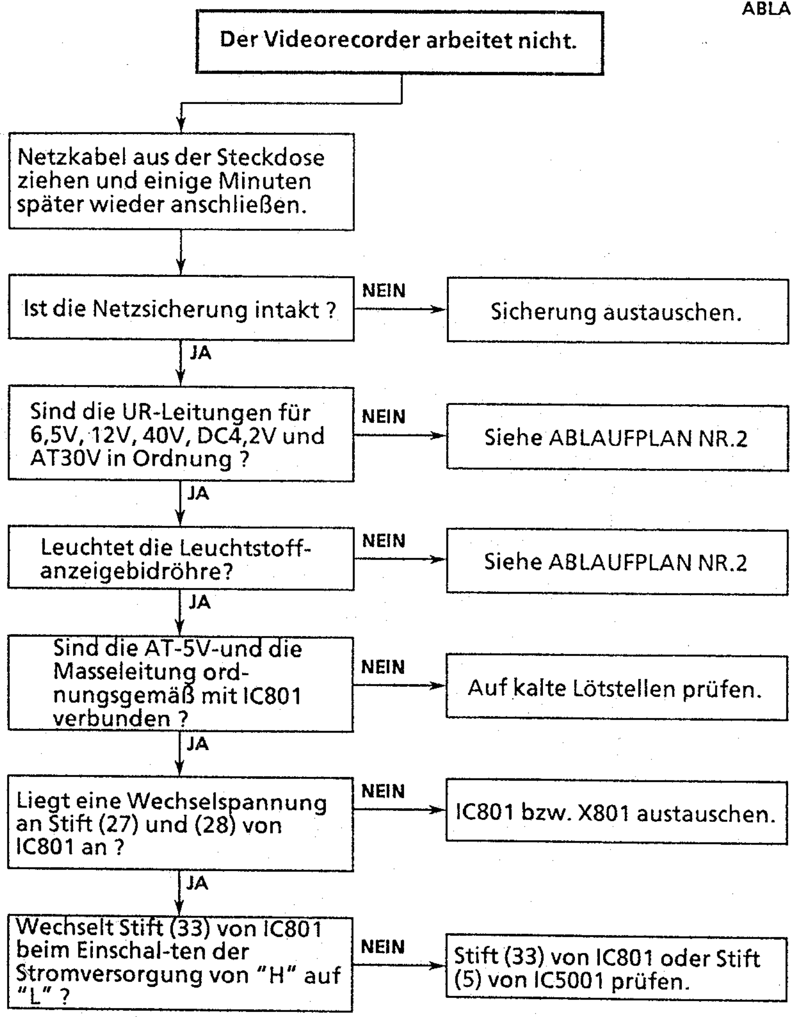

Die Cassettensteuereinheit entfernen, das Gerät einschalten und die Wiedergabetaste (PB) drücken.
Wickelt das Band während der Wiedergabe richtig auf?
NEIN
Mit der Routine "2. AUFNAHME/WIEDERGABESTÖRUNG" fortfahren.
JA
Die VSR Taste drücken. (Die Spulenscheibe mit dem Finger drehen.)
Befindet sich der Bremsumschalter in der VSR-Position.
NEIN
Den Bremsumschalter auswechseln.
JA
Bewegt sich das Zwishenzahnrad gegen die Abwickel-Spulenscheibe?
NEIN
Die Zwischenzahnrad einheit auswechseln.
JA
Befindet sich das Spulenscheibendrehmoment zwischen 140 und 200 g·cm?
NEIN
Die Abwickel-Spulenscheibe auswechseln.
JA
Die Hautplatine überprüfen.

4. UNGEWÖHNLICHER TON IN JEDER EINZELNEN BETRIEBSART


Eine Cassette einlegen und wiederholt die PLAY- und STOP-Taste drücken.
Beim Lade- und Entladevorgang auf Rattergeräusche überprüfen.
NEIN
Die Ladeblock-Hilfs einheit auswechseln.
JA
Das Gerät ausschalten und die Cassettensteuereinheit entfernen.
Entspricht die Spulenscheibenhöhe der Spezifikation?
NEIN
Die Spulenscheibenhöhe nachstellen.
JA
Gerät eingeschaltet.
FF-Taste gedrückt.
Wird im Schnellvorauf ein gewöhnlicher Ton erzeugt?
JA
Die Aufwickel-Spulenscheibe langsam mit dem Finger drehen. Besteht zwischer dem Aufwiokel-Spulen scheibenanschlag und dem Wiedergabe zahnrad eine Reibung?
NEIN
Den Aufwickel-Spulen scheibenanschlag auswechseln.
NEIN
Die REW-Taste drücken und die Abwickel-Spulenscheibe mit dem Finger drehen.
JA
Den Spulenschelbenriemen abnehmen, die Aufwickel-Spulenscheibe mit dem Finger drehen und die FF-Taste drücken.
Wird bei laufendem Antriebsachsen-Direktantriebsmotor ein gwöhnlicher Ton erzeugt?
JA
Den Antriebsachsen-Direktantriebsmotor auswechseln.
NEIN
Wird bei der Wiedergabe ein gewöhnlicher Ton erzeugt?
JA
Die Abwickel-Spulenscheibe auf- und abbewegen. Besteht übermäßiges Spiel?
NEIN
Den Abwickel-Spulen scheibenanschlag auswechseln.
JA
NEIN
Die Abwickel-Spulenscheibe langsam drehen. Tritt keine Reibung an der Unterseite auf?
NEIN
Die Abwickel-Spulenscheibe auswechseln.
JA
Wenn in jeder einzelnen Betriebsart ein gewöhnlicher Ton auffritt, zum Anfang der Routine gehen und erneut überprüfen?

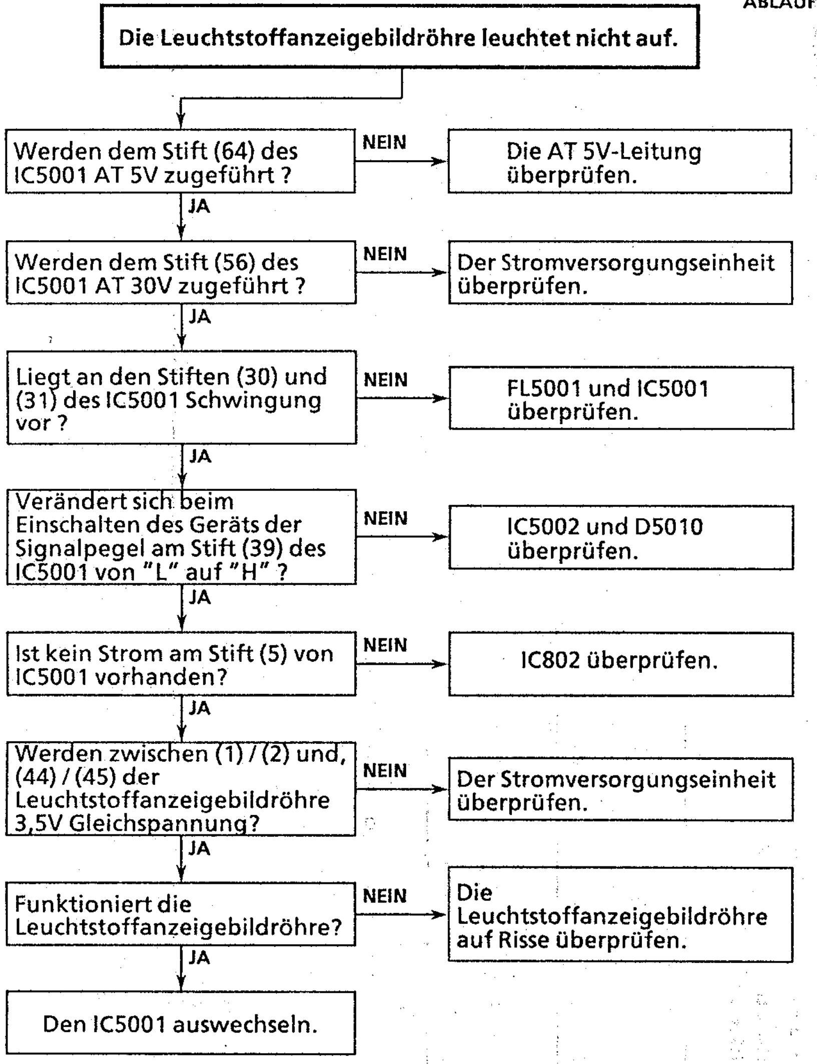
STROMVERSORGUNG, STÖRUNGSBSETIGUNG

ABLAUFPLAN NR.1


Der Videorecorder arbeitet nicht.
Netzkabel aus der Steckdose ziehen und einige Minuten später wieder anschließen.
Ist die Netzsicherung intakt ?
NEIN
Sicherung austauschen.
JA
Sind die UR-Leitungen für 6,5V, 12V, 40V, DC4,2V und AT30V in Ordnung ?
NEIN
Siehe ABLAUFPLAN NR.2
JA
Leuchtet die Leuchtstoff-anzeigebidröhre?
NEIN
Siehe ABLAUFPLAN NR.2
JA
Sind die AT-5V-und die Masseleitung ord-nungsgemäß mit IC801 verbunden ?
NEIN
Auf kalte Lötstellen prüfen.
JA
Liegt eine Wechselspannung an Stift (27) und (28) von IC801 an ?
NEIN
IC801 bzw. X801 austauschen.
JA
Wechselt Stift (33) von IC801 beim Einschal-ten der Stromversorgung von "H" auf "L" ?
NEIN
Stift (33) von IC801 oder Stift (5) von IC5001 prüfen.

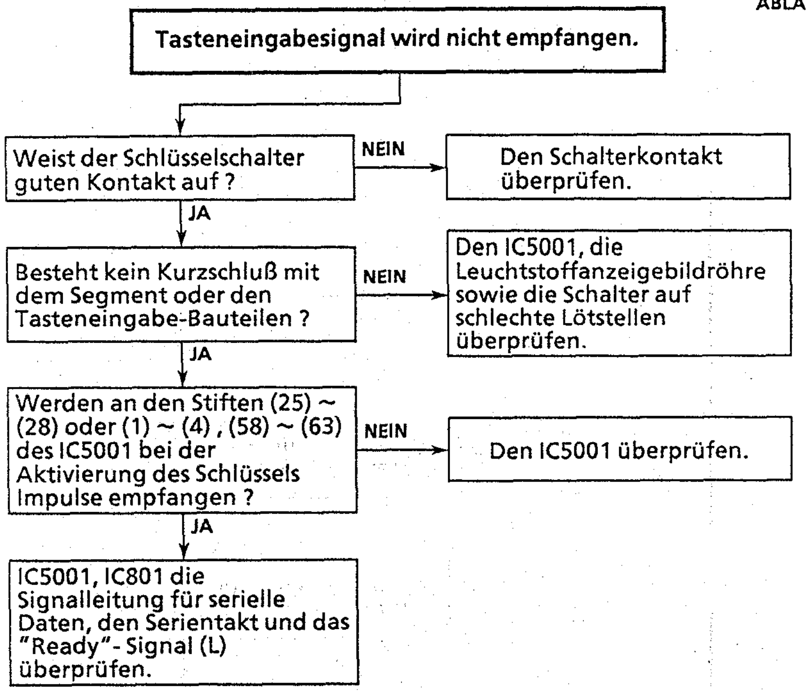
TIMER (1) FEHLERSUCHE

ABLAUFPLAN NR. 2


Die Leuchtstoffanzeigebildröhre leuchtet nicht auf.
Werden dem Stift (64) des IC5001 AT 5V zugeführt ?
NEIN
Die AT 5V-Leitung überprüfen.
JA
Werden dem Stift (56) des IC5001 AT 30V zugeführt ?
NEIN
Der Stromversorgungseinheit überprüfen.
JA
Liegt an den Stiften (30) und (31) des IC5001 Schwingung vor ?
NEIN
FL5001 und IC5001 überprüfen.
JA
Verändert sich beim Einschalten des Geräts der Signalpegel am Stift (39) des IC5001 von "L" auf "H" ?
NEIN
IC5002 und D5010 überprüfen.
JA
Ist kein Strom am Stift (5) von IC5001 vorhanden?
NEIN
IC802 überprüfen.
JA
Werden zwischen (1) / (2) und, (44) / (45) der Leuchtstoffanzeigebildröhre 3,5V Gleichspannung?
NEIN
Der Stromversorgungseinheit überprüfen.
JA
Funktioniert die Leuchtstoffanzeigebildröhre?
NEIN
Die Leuchtstoffanzeigebildröhre auf Risse überprüfen.
JA
Den IC5001 auswechseln.

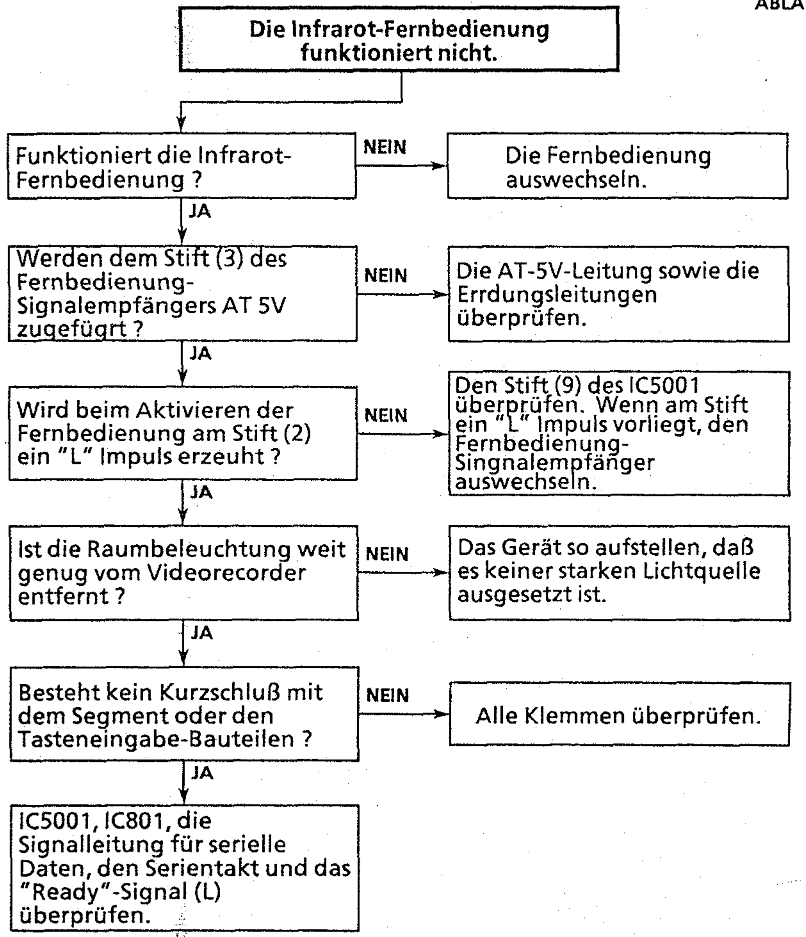
TIMER (2) FEHLERSUCHE

ABLAUFPLAN NR. 3


Tasteneingabesignal wird nicht empfangen.
Weist der Schlüsselschalter guten Kontakt auf ?
NEIN
Den Schalterkontakt überprüfen.
JA
Besteht kein Kurzschluß mit dem Segment oder den Tasteneingabe-Bauteilen ?
NEIN
Den IC5001, die Leuchtstoffanzeigebildröhre sowie die Schalter auf schlechte Lötstellen überprüfen.
JA
Werden an den Stiften (25) ~ (28) oder (1) ~ (4), (58) ~ (63) des IC5001 bei der Aktivierung des Schlüssels Impulse empfangen ?
NEIN
Den IC5001 überprüfen.
JA
IC5001, IC801 die Signalleitung für serielle Daten, den Serientakt und das "Ready"- Signal (L) überprüfen.

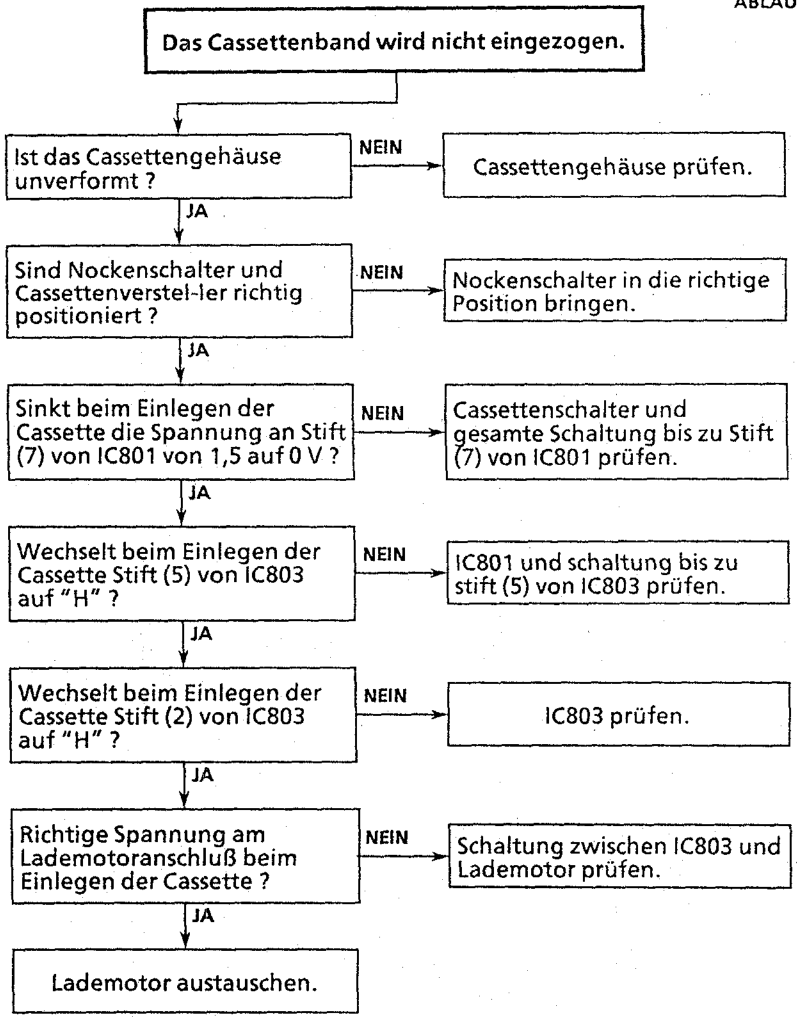
FEHLERSUCHE FUR INFRAROT-FERNBEDIENUNG

ABLAUFPLAN NR. 4


Die Infrarot-Fernbedienung funktioniert nicht.
Funktioniert die Infrarot-Fernbedienung ?
NEIN
Die Fernbedienung auswechseln.
JA
Werden dem Stift (3) des Fernbedienung-Signalempfängers AT 5V zugefügrt ?
NEIN
Die AT-5V-Leitung sowie die Errdungsleitungen überprüfen.
JA
Wird beim Aktivieren der Fernbedienung am Stift (2) ein "L" Impuls erzeuht ?
NEIN
Den Stift (9) des IC5001 überprüfen. Wenn am Stift ein "L" Impuls vorliegt, den Fernbedienung-Singnalempfänger auswechseln.
JA
Ist die Raumbeleuchtung weit genug vom Videorecorder entfernt ?
NEIN
Das Gerät so aufstellen, daß es keiner starken Lichtquelle ausgesetzt ist.
JA
Besteht kein Kurzschluß mit dem Segment oder den Tasteneingabe-Bauteilen ?
NEIN
Alle Klemmen überprüfen.
JA
IC5001, IC801, die Signalleitung für serielle Daten, den Serientakt und das "Ready"-Signal (L) überprüfen.

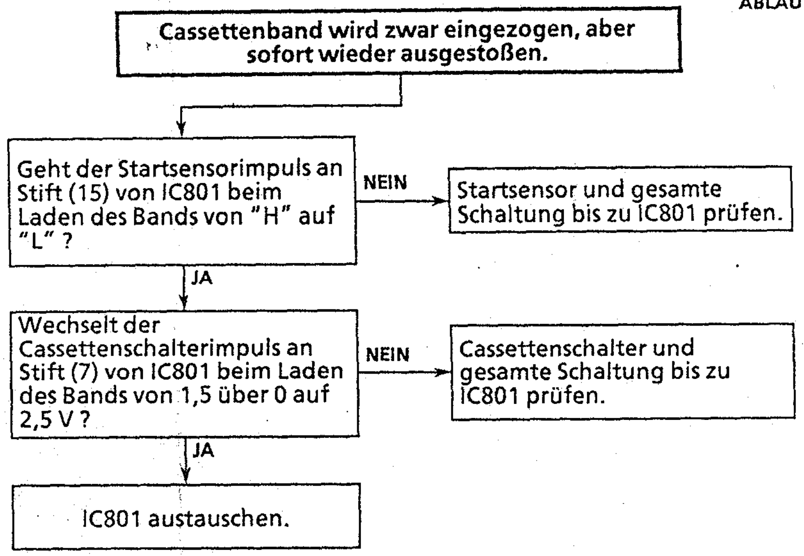
CASSETTENSTEUEREINHEIT, STÖRUNGSBSETIGUNG

ABLAUFPLAN NR. 5


Das Cassettenband wird nicht eingezogen.
Ist das Cassettengehäuse unverformt ?
NEIN
Cassettengehäuse prüfen.
JA
Sind Nockenschalter und Cassettenverstel-ler richtig positioniert ?
NEIN
Nockenschalter in die richtige Position bringen.
JA
Sinkt beim Einlegen der Cassette die Spannung an Stift (7) von IC801 von 1,5 auf 0 V ?
NEIN
Cassettenschalter und gesamte Schaltung bis zu Stift (7) von IC801 prüfen.
JA
Wechselt beim Einlegen der Cassette Stift (5) von IC803 auf "H" ?
NEIN
IC801 und schaltung bis zu stift (5) von IC803 prüfen.
JA
Wechselt beim Einlegen der Cassette Stift (2) von IC803 auf "H" ?
NEIN
IC803 prüfen.
JA
Richtige Spannung am Lademotoranschluß beim Einlegen der Cassette ?
NEIN
Schaltung zwischen IC803 und Lademotor prüfen.
JA
Lademotor austauschen.

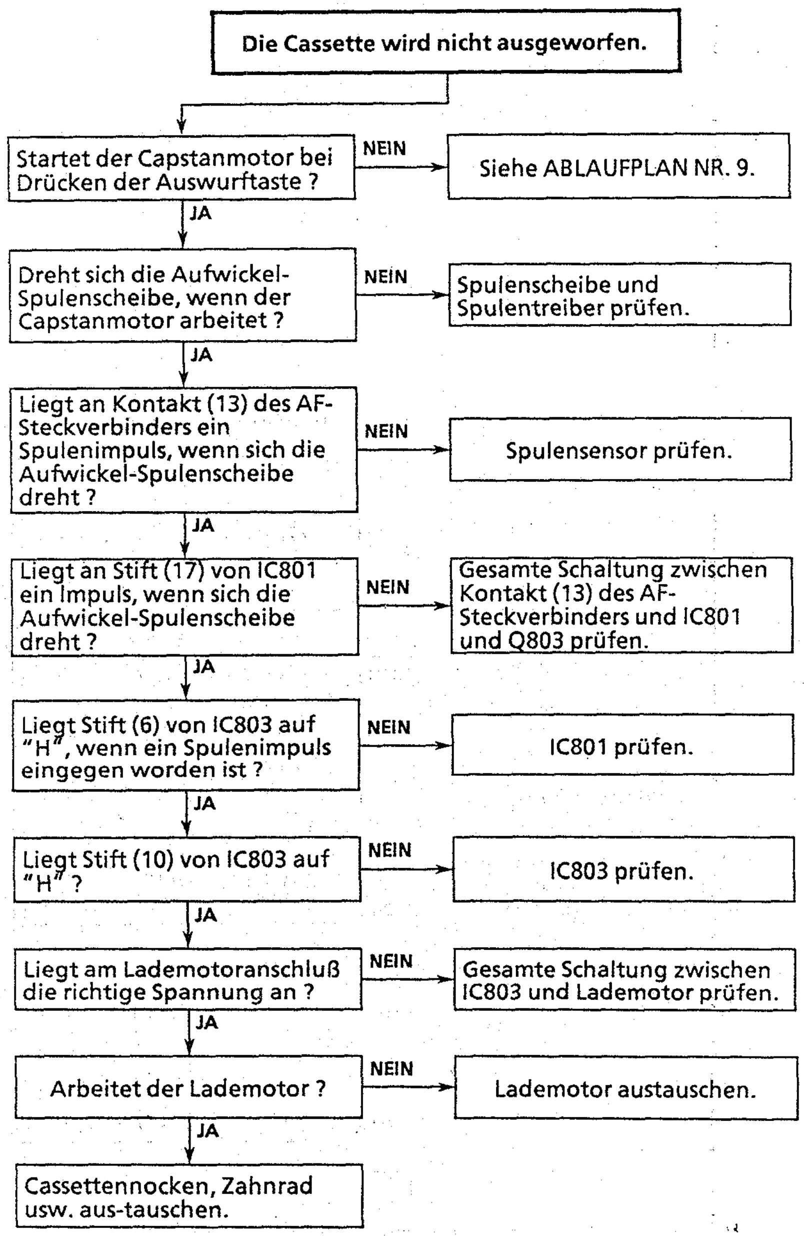
CASSETTENSTEUEREINHEIT, STÖRUNGSBSETIGUNG

ABLAUFPLAN NR. 6


Cassettenband wird zwar eingezogen, aber sofort wieder ausgestoßen.
Geht der Startsensorimpuls an Stift (15) von IC801 beim Laden des Bands von "H" auf "L" ?
NEIN
Startsensor und gesamte Schaltung bis zu IC801 prüfen.
JA
Wechselt der Cassettenschalterimpuls an Stift (7) von IC801 beim Laden des Bands von 1,5 über 0 auf 2,5 V ?
NEIN
Cassettenschalter und gesamte Schaltung bis zu IC801 prüfen.
JA
IC801 austauschen.

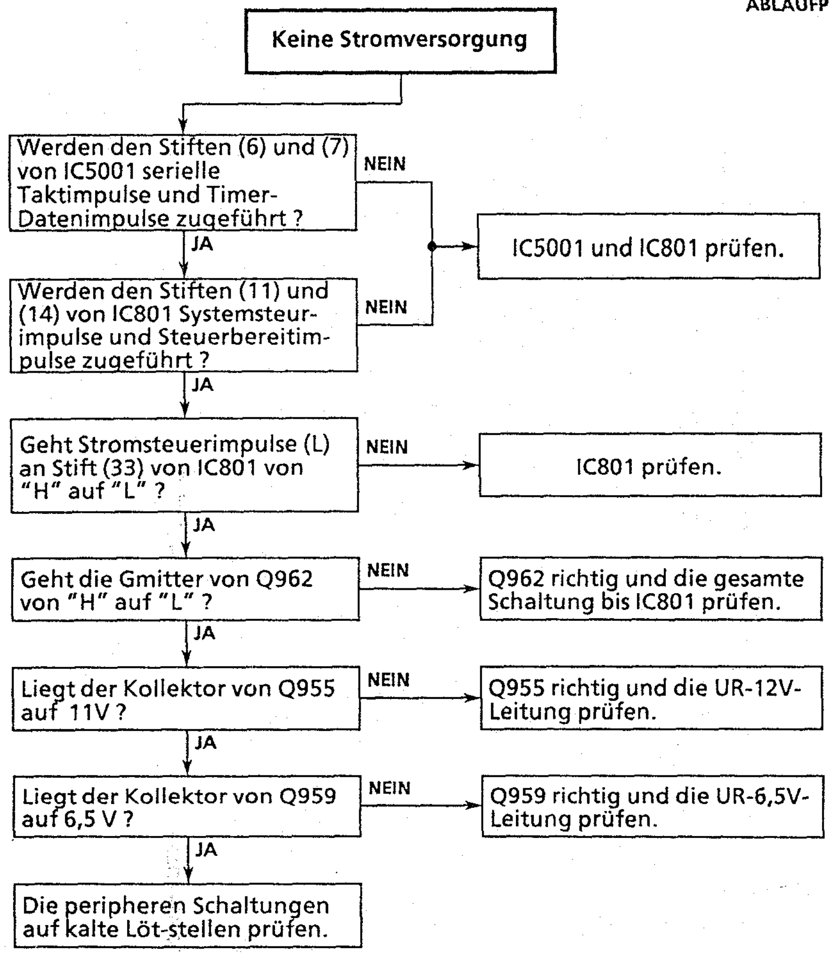
LADEMOTOR UND CASSETTENAUSWURF, STÖRUNGSBESETIGUNG

ABLAUFPLAN NR. 7


Die Cassette wird nicht ausgeworfen.
Startet der Capstanmotor bei Drücken der Auswurftaste ?
NEIN
Siehe ABLAUFPLAN NR. 9.
JA
Dreht sich die Aufwickel-Spulenscheibe, wenn der Capstanmotor arbeitet ?
NEIN
Spulenscheibe und Spulentreiber prüfen.
JA
Liegt an Kontakt (13) des AF-Steckverbinders ein Spulenimpuls, wenn sich die Aufwickel-Spulenscheibe dreht ?
NEIN
Spulensensor prüfen.
JA
Liegt an Stift (17) von IC801 ein Impuls, wenn sich die Aufwickel-Spulenscheibe dreht ?
NEIN
Gesamte Schaltung zwischen Kontakt (13) des AF-Steckverbinders und IC801 und Q803 prüfen.
JA
Liegt Stift (6) von IC803 auf "H", wenn ein Spulenimpuls eingegen worden ist ?
NEIN
IC801 prüfen.
JA
Liegt Stift (10) von IC803 auf "H" ?
NEIN
IC803 prüfen.
JA
Liegt am Lademotoranschluß die richtige Spannung an ?
NEIN
Gesamte Schaltung zwischen IC803 und Lademotor prüfen.
JA
Arbeitet der Lademotor ?
NEIN
Lademotor austauschen.
JA
Cassettennocken, Zahnrad usw. aus-tauschen.

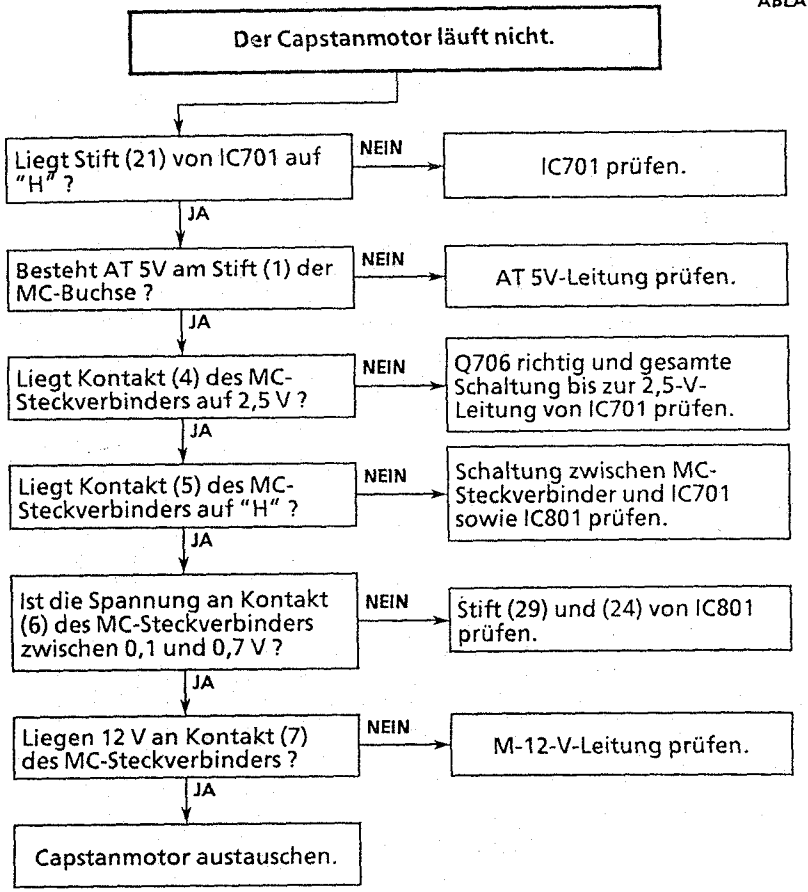
SYSTEMSTEUERUNG, STÖRUNGSBESETIGUNG

ABLAUFPLAN NR. 8


Keine Stromversorgung
Werden den Stiften (6) und (7) von IC5001 serielle Taktimpulse und Timer-Datenimpulse zugeführt ?
NEIN
IC5001 und IC801 prüfen.
JA
Werden den Stiften (11) und (14) von IC801 Systemsteuerimpulse und Steuerbereitimpulse zugeführt ?
NEIN
JA
Geht Stromsteuerimpulse (L) an Stift (33) von IC801 von "H" auf "L" ?
NEIN
IC801 prüfen.
JA
Geht die Gmitter von Q962 von "H" auf "L" ?
NEIN
Q962 richtig und die gesamte Schaltung bis IC801 prüfen.
JA
Liegt der Kollektor von Q955 auf 11V ?
NEIN
Q955 richtig und die UR-12V-Leitung prüfen.
JA
Liegt der Kollektor von Q959 auf 6,5 V ?
NEIN
Q959 richtig und die UR-6,5V-Leitung prüfen.
JA
Die peripheren Schaltungen auf kalte Löt-stellen prüfen.

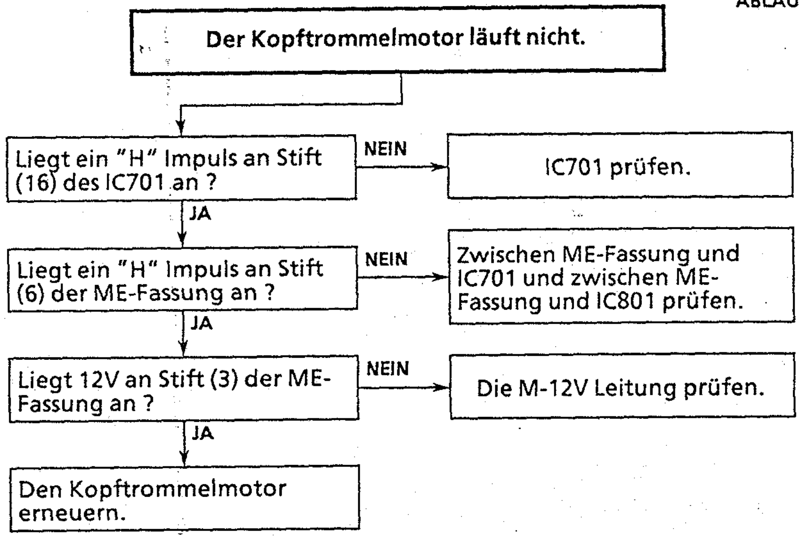
CAPSTANMOTOR, STÖRUNGSBSETIGUNG

ABLAUFPLAN NR. 9

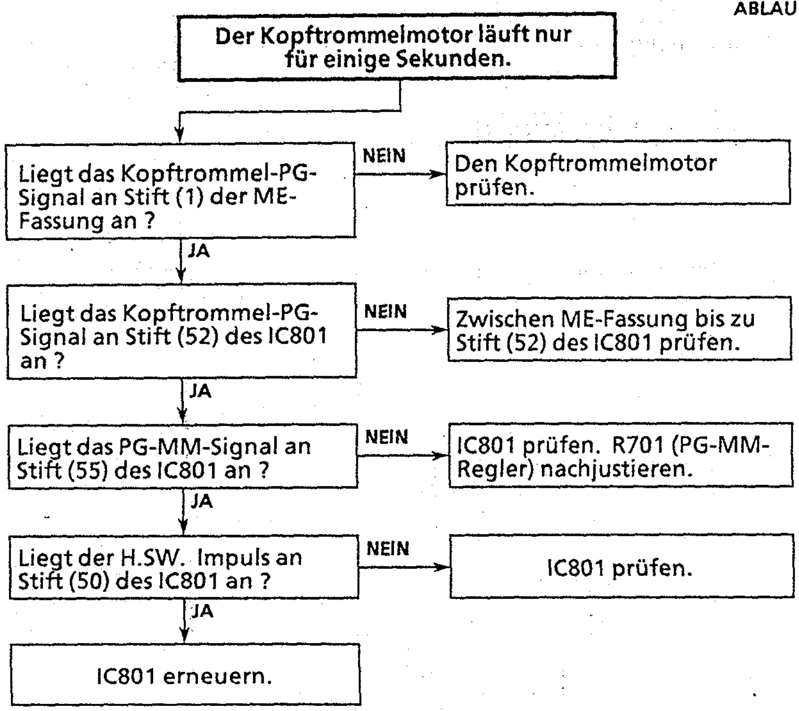

Der Capstanmotor läuft nicht.
Liegt Stift (21) von IC701 auf "H" ?
NEIN
IC701 prüfen.
JA
Besteht AT 5V am Stift (1) der MC-Buchse ?
NEIN
AT 5V-Leitung prüfen.
JA
Liegt Kontakt (4) des MC-Steckverbinders auf 2,5 V ?
NEIN
Q706 richtig und gesamte Schaltung bis zur 2,5-V-Leitung von IC701 prüfen.
JA
Liegt Kontakt (5) des MC-Steckverbinders auf "H" ?
NEIN
Schaltung zwischen MC-Steckverbinder und IC701 sowie IC801 prüfen.
JA
Ist die Spannung an Kontakt (6) des MC-Steckverbinders zwischen 0,1 und 0,7 V ?
NEIN
Stift (29) und (24) von IC801 prüfen.
JA
Liegen 12 V an Kontakt (7) des MC-Steckverbinders ?
NEIN
M-12-V-Leitung prüfen.
JA
Capstanmotor austauschen.

KOPFTROMMELMOTOR-STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 10

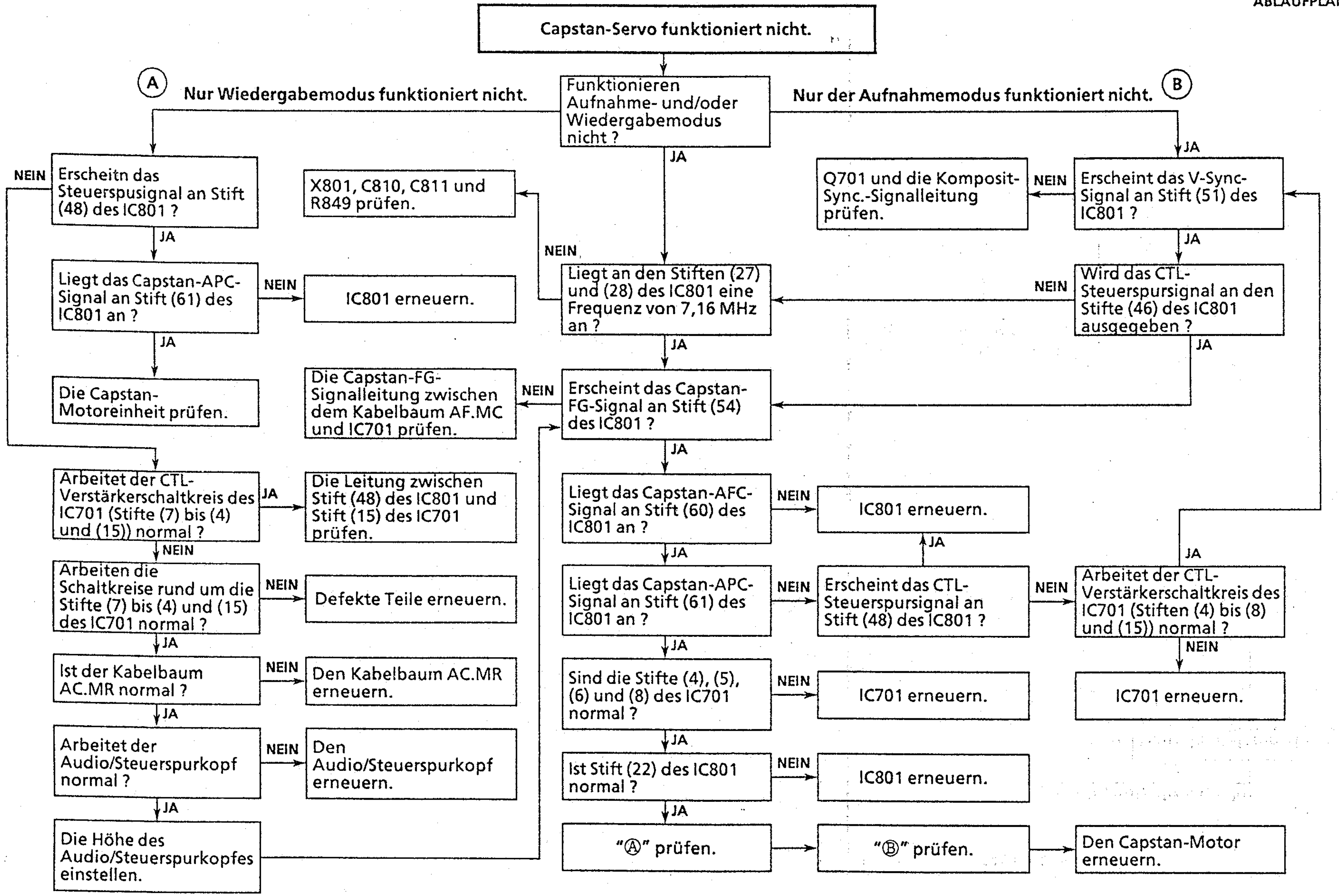

Der Kopftrommelmotor läuft nicht.
Liegt ein "H" Impuls an Stift (16) des IC701 an ?
NEIN
IC701 prüfen.
JA
Liegt ein "H" Impuls an Stift (6) der ME-Fassung an ?
NEIN
Zwischen ME-Fassung und IC701 und zwischen ME-Fassung und IC801 prüfen.
JA
Liegt 12V an Stift (3) der ME-Fassung an ?
NEIN
Die M-12V Leitung prüfen.
JA
Den Kopftrommelmotor erneuern.

ABLAUFPLAN NR. 11

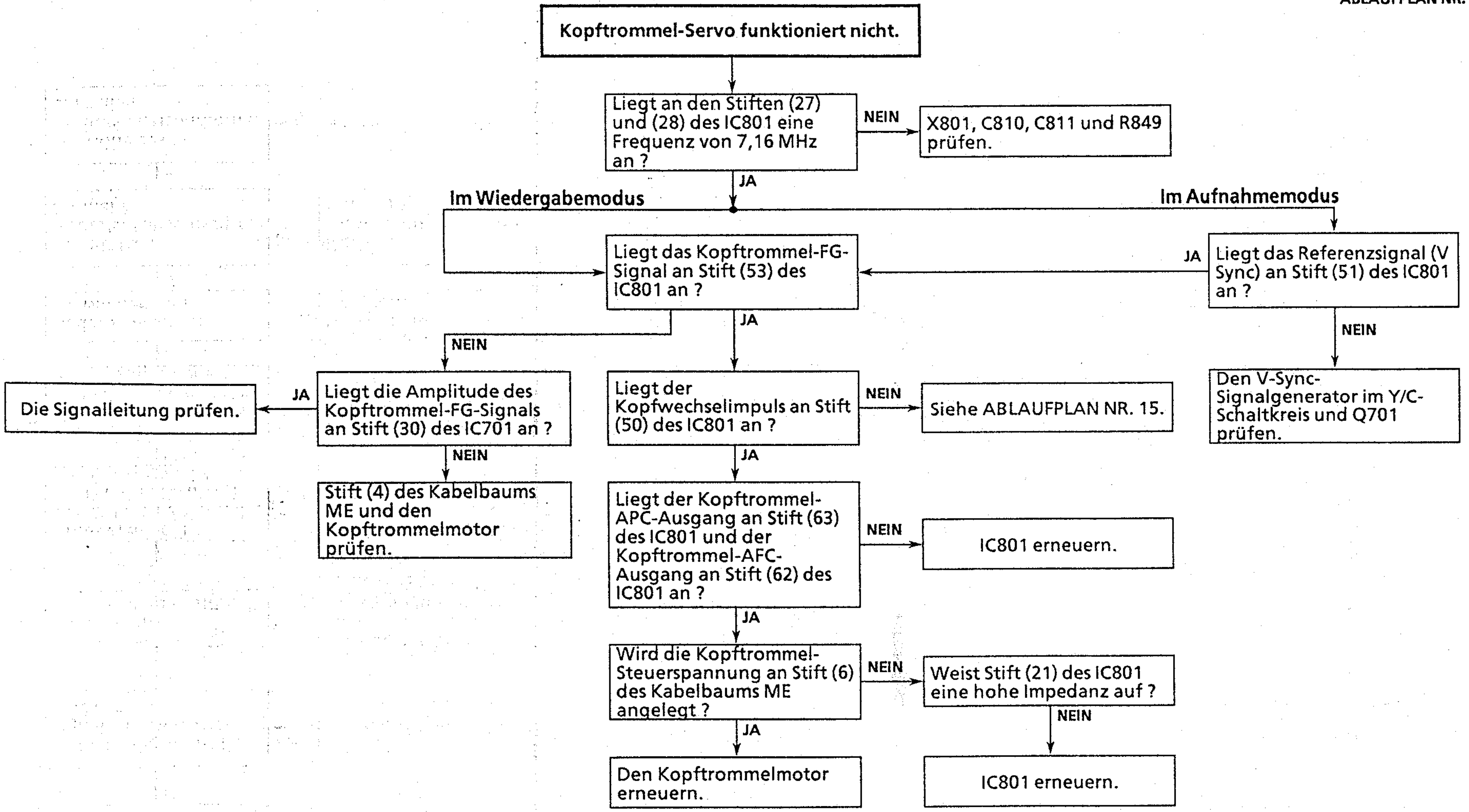

Der Kopftrommelmotor läuft nur für einige Sekunden.
Liegt das Kopftrommel-PG-Signal an Stift (1) der ME-Fassung an ?
NEIN
Den Kopftrommelmotor prüfen.
JA
Liegt das Kopftrommel-PG-Signal an Stift (52) des IC801 an ?
NEIN
Zwischen ME-Fassung bis zu Stift (52) des IC801 prüfen.
JA
Liegt das PG-MM-Signal an Stift (55) des IC801 an ?
NEIN
IC801 prüfen. R701 (PG-MM-Regler) nachjustieren.
JA
Liegt der H.SW. Impuls an Stift (50) des IC801 an ?
NEIN
IC801 prüfen.
JA
IC801 erneuern.

ABLAUFPLAN NR. 13

CAPSTAN-SERVO-STÖRUNGSBESEITIGUNG


Capstan-Servo funktioniert nicht.
Funktionieren Aufnahme- und/oder Wiedergabemodus nicht ?
Ⓐ Nur Wiedergabemodus funktioniert nicht.
Nur der Aufnahmemodus funktioniert nicht. Ⓑ
JA
NEIN
Erscheitn das Steuerspusignal an Stift (48) des IC801 ?
Liegt das Capstan-APC-Signal an Stift (61) des IC801 an ?
IC801 erneuern.
Die Capstan-Motoreinheit prüfen.
X801, C810, C811 und R849 prüfen.
Liegt an den Stiften (27) und (28) des IC801 eine Frequenz von 7,16 MHz an ?
Erscheint das Capstan-FG-Signal an Stift (54) des IC801 ?
Die Capstan-FG-Signalleitung zwischen dem Kabelbaum AF.MC und IC701 prüfen.
Arbeitet der CTL-Verstärkerschaltkreis des IC701 (Stifte (7) bis (4) und (15)) normal ?
Die Leitung zwischen Stift (48) des IC801 und Stift (15) des IC701 prüfen.
Arbeiten die Schaltkreise rund um die Stifte (7) bis (4) und (15) des IC701 normal ?
Defekte Teile erneuern.
Ist der Kabelbaum AC.MR normal ?
Den Kabelbaum AC.MR erneuern.
Arbeitet der Audio/Steuerspurkopf normal ?
Den Audio/Steuerspurkopf erneuern.
Die Höhe des Audio/Steuerspurkopfes einstellen.
Erscheint das V-Sync-Signal an Stift (51) des IC801 ?
Q701 und die Komposit-Sync.-Signalleitung prüfen.
Wird das CTL-Steuerspursignal an den Stifte (46) des IC801 ausgegeben ?
Liegt das Capstan-AFC-Signal an Stift (60) des IC801 an ?
IC801 erneuern.
Liegt das Capstan-APC-Signal an Stift (61) des IC801 an ?
Erscheint das CTL-Steuerspursignal an Stift (48) des IC801 ?
Arbeitet der CTL-Verstärkerschaltkreis des IC701 (Stiften (4) bis (8) und (15)) normal ?
IC701 erneuern.
Sind die Stifte (4), (5), (6) und (8) des IC701 normal ?
IC701 erneuern.
Ist Stift (22) des IC801 normal ?
IC801 erneuern.
"Ⓐ" prüfen.
"Ⓑ" prüfen.
Den Capstan-Motor erneuern.

KOPFTROMMEL-SERVO-STÖRUNGSBESETIGUNG



Kopftrommel-Servo funktioniert nicht.

Liegt an den Stiften (27) und (28) des IC801 eine Frequenz von 7,16 MHz an ?

X801, C810, C811 und R849 prüfen.

Liegt das Kopftrommel-FG-Signal an Stift (53) des IC801 an ?

Liegt das Referenzsignal (V Sync) an Stift (51) des IC801 an ?

Den V-Sync-Signalgenerator im Y/C-Schaltkreis und Q701 prüfen.

Liegt die Amplitude des Kopftrommel-FG-Signals an Stift (30) des IC701 an ?

Die Signalleitung prüfen.

Stift (4) des Kabelbaums ME und den Kopftrommelmotor prüfen.

Liegt der Kopfwechselimpuls an Stift (50) des IC801 an ?

Siehe ABLAUFPLAN NR. 15.

Liegt der Kopftrommel-APC-Ausgang an Stift (63) des IC801 und der Kopftrommel-AFC-Ausgang an Stift (62) des IC801 an ?

IC801 erneuern.

Wird die Kopftrommel-Steuerspannung an Stift (6) des Kabelbaums ME angelegt ?

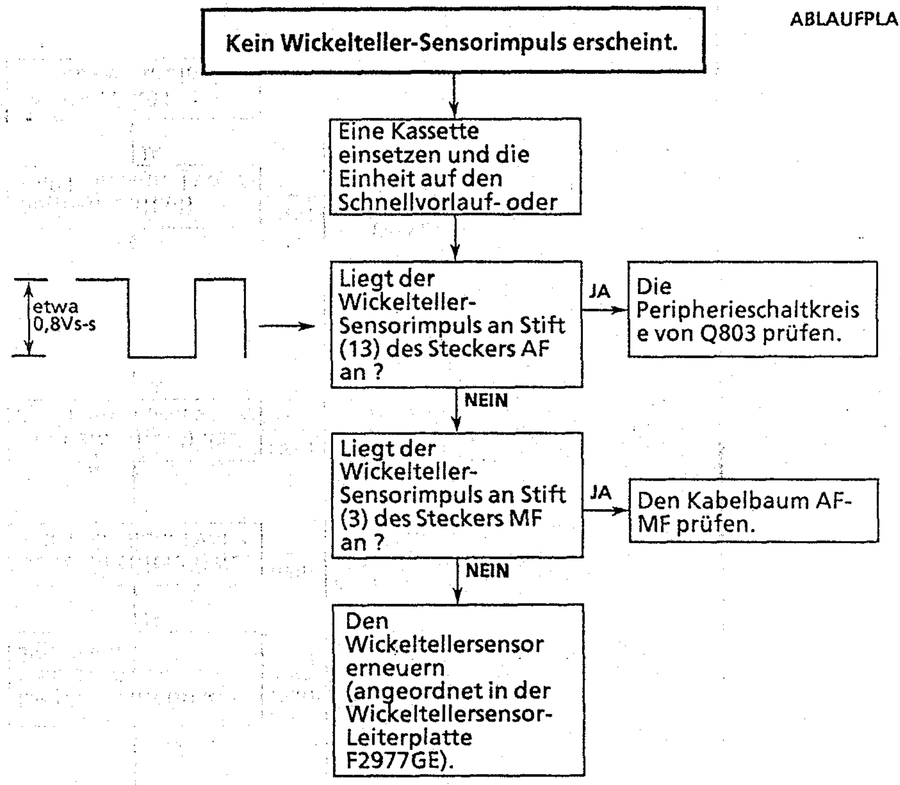
Den Kopftrommelmotor erneuern.

Weist Stift (21) des IC801 eine hohe Impedanz auf ?

IC801 erneuern.

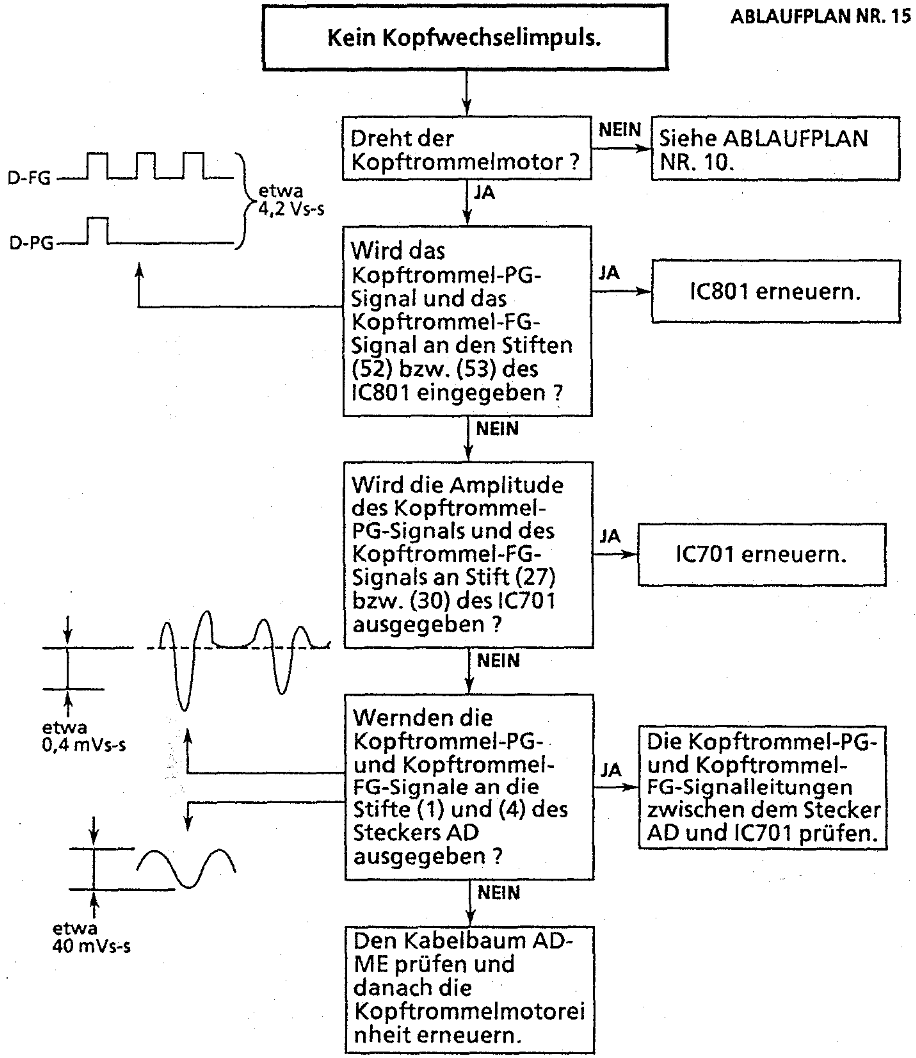
AUFWICKELTELLER-IMPULSGENERATOR-STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 14


Kein Wickelteller-Sensorimpuls erscheint.
Eine Kassette einsetzen und die Einheit auf den Schnellvorlauf- oder
Liegt der Wickelteller-Sensorimpuls an Stift (13) des Steckers AF an ?
JA
Die Peripherieschaltkreise von Q803 prüfen.
NEIN
Liegt der Wickelteller-Sensorimpuls an Stift (3) des Steckers MF an ?
JA
Den Kabelbaum AF-MF prüfen.
NEIN
Den Wickeltellersensor erneuern (angeordnet in der Wickeltellersensor-Leiterplatte F2977GE).
etwa 0,8Vs-s

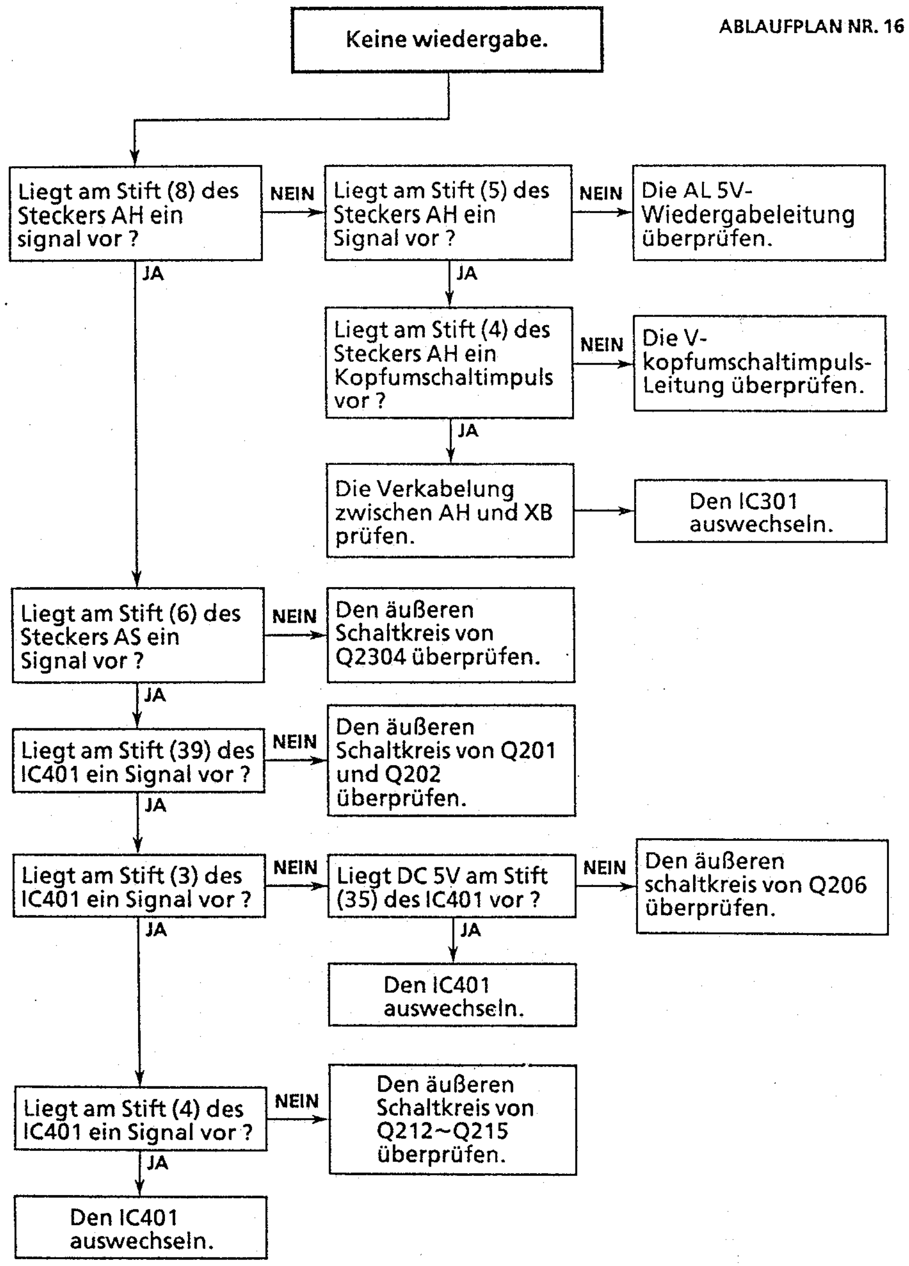
KOPFWECHSELIMPULS-STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 15


Kein Kopfwechselimpuls.
Dreht der Kopftrommelmotor ?
NEIN
Siehe ABLAUFPLAN NR. 10.
JA
Wird das Kopftrommel-PG-Signal und das Kopftrommel-FG-Signal an den Stiften (52) bzw. (53) des IC801 eingegeben ?
JA
IC801 erneuern.
NEIN
Wird die Amplitude des Kopftrommel-PG-Signals und des Kopftrommel-FG-Signals an Stift (27) bzw. (30) des IC701 ausgegeben ?
JA
IC701 erneuern.
NEIN
Wernden die Kopftrommel-PG- und Kopftrommel-FG-Signale an die Stifte (1) und (4) des Steckers AD ausgegeben ?
JA
Die Kopftrommel-PG- und Kopftrommel-FG-Signalleitungen zwischen dem Stecker AD und IC701 prüfen.
NEIN
Den Kabelbaum AD-ME prüfen und danach die Kopftrommelmotoreinheit erneuern.
D-FG
D-PG
etwa 4,2 Vs-s
etwa 0,4 mVs-s
etwa 40 mVs-s

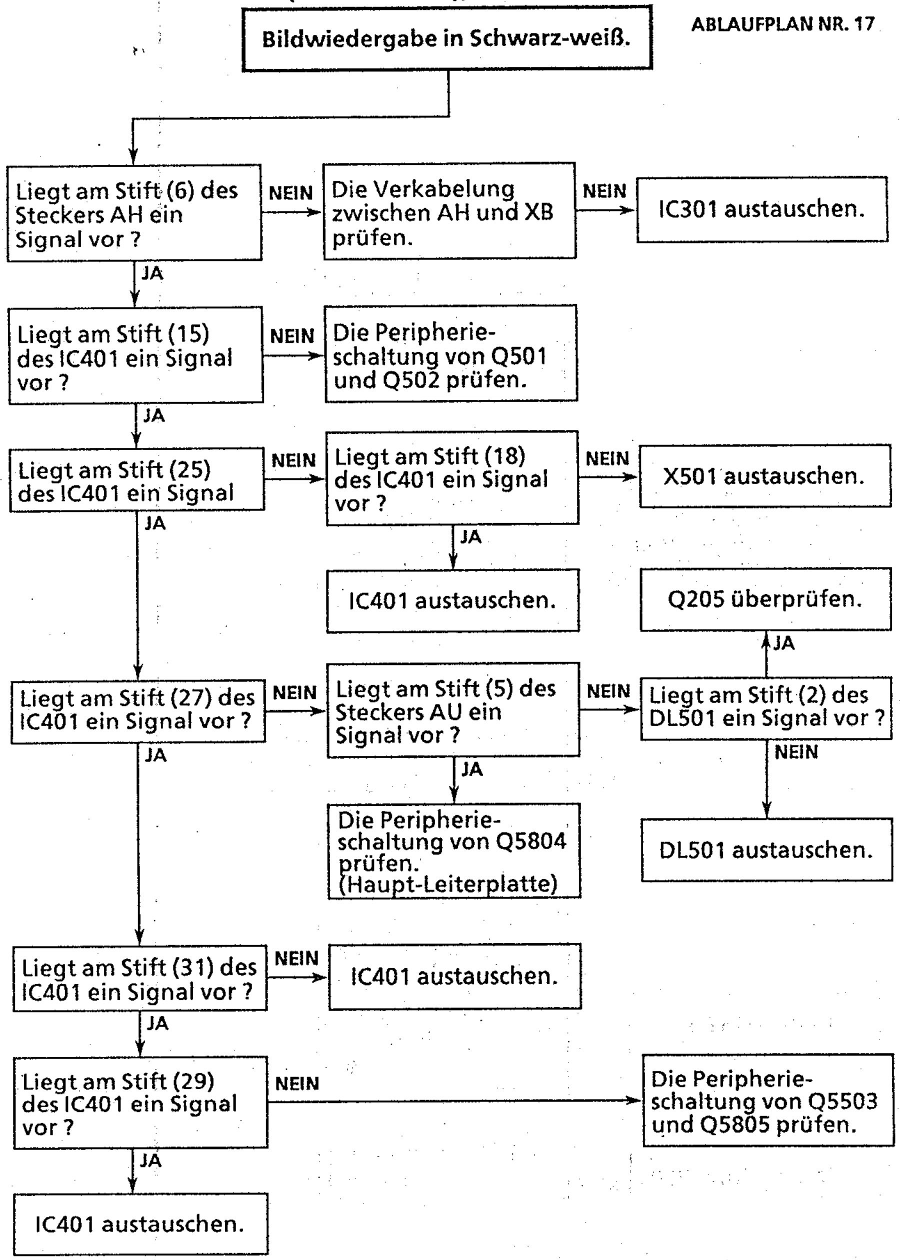
FEHLERSUCHE FÜR WIEDERGABE FUNKTION (LUMINANZ)

ABLAUFPLAN NR. 16


Keine wiedergabe.
Liegt am Stift (8) des Steckers AH ein signal vor ?
NEIN
Liegt am Stift (5) des Steckers AH ein Signal vor ?
NEIN
Die AL 5V-Wiedergabeleitung überprüfen.
JA
Liegt am Stift (4) des Steckers AH ein Kopfumschaltimpuls vor ?
NEIN
Die V-kopfumschaltimpuls-Leitung überprüfen.
JA
Die Verkabelung zwischen AH und XB prüfen.
Den IC301 auswechseln.
JA
Liegt am Stift (6) des Steckers AS ein Signal vor ?
NEIN
Den äußeren Schaltkreis von Q2304 überprüfen.
JA
Liegt am Stift (39) des IC401 ein Signal vor ?
NEIN
Den äußeren Schaltkreis von Q201 und Q202 überprüfen.
JA
Liegt am Stift (3) des IC401 ein Signal vor ?
NEIN
Liegt DC 5V am Stift (35) des IC401 vor ?
NEIN
Den äußeren schaltkreis von Q206 überprüfen.
JA
Den IC401 auswechseln.
JA
Liegt am Stift (4) des IC401 ein Signal vor ?
NEIN
Den äußeren Schaltkreis von Q212~Q215 überprüfen.
JA
Den IC401 auswechseln.

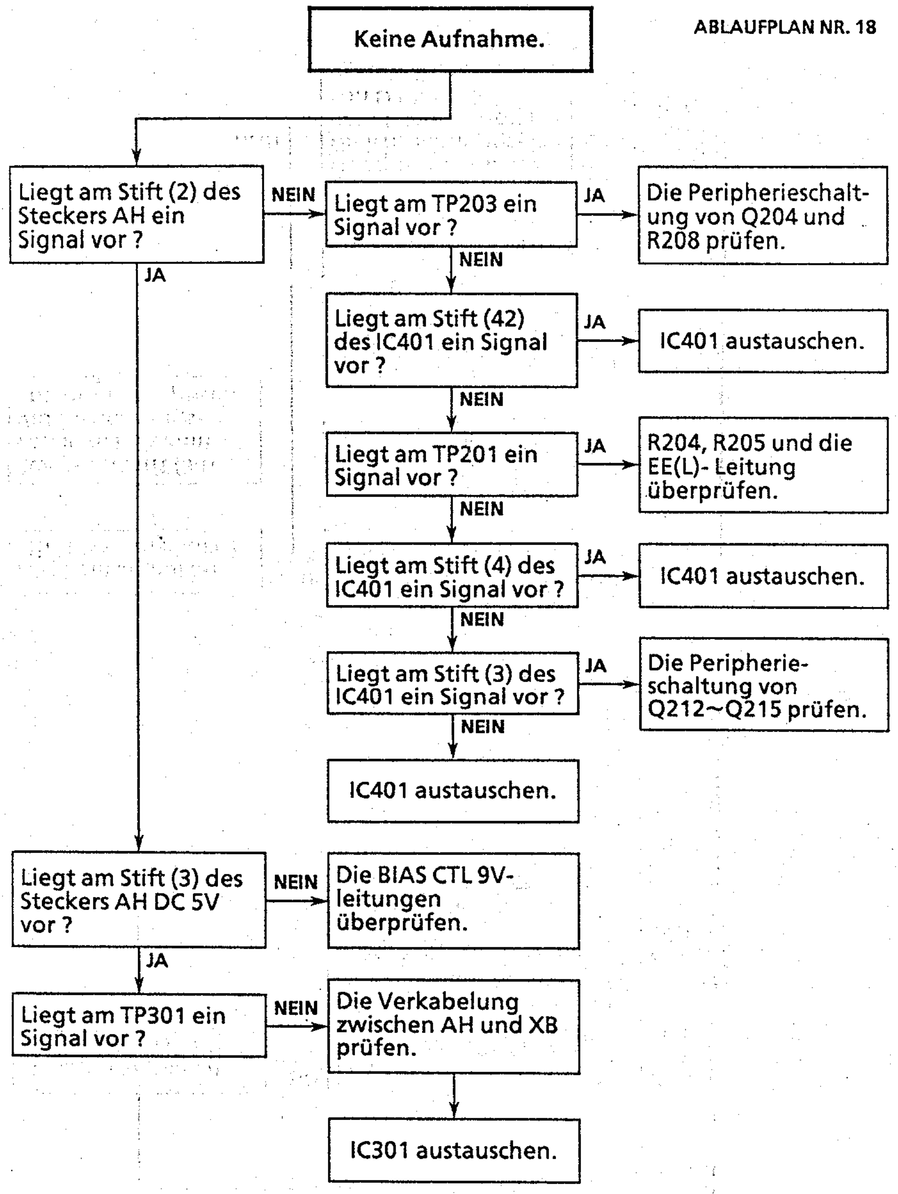
WIEDERGABE (CHROMINANZ), STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 17


Bildwiedergabe in Schwarz-weiß.
Liegt am Stift (6) des Steckers AH ein Signal vor ?
NEIN
Die Verkabelung zwischen AH und XB prüfen.
NEIN
IC301 austauschen.
JA
Liegt am Stift (15) des IC401 ein Signal vor ?
NEIN
Die Peripherie-schaltung von Q501 und Q502 prüfen.
JA
Liegt am Stift (25) des IC401 ein Signal
NEIN
Liegt am Stift (18) des IC401 ein Signal vor ?
NEIN
X501 austauschen.
JA
IC401 austauschen.
JA
Liegt am Stift (27) des IC401 ein Signal vor ?
NEIN
Liegt am Stift (5) des Steckers AU ein Signal vor ?
NEIN
Liegt am Stift (2) des DL501 ein Signal vor ?
JA
Q205 überprüfen.
NEIN
DL501 austauschen.
JA
Die Peripherie-schaltung von Q5804 prüfen. (Haupt-Leiterplatte)
JA
Liegt am Stift (31) des IC401 ein Signal vor ?
NEIN
IC401 austauschen.
JA
Liegt am Stift (29) des IC401 ein Signal vor ?
NEIN
Die Peripherie-schaltung von Q5503 und Q5805 prüfen.
JA
IC401 austauschen.

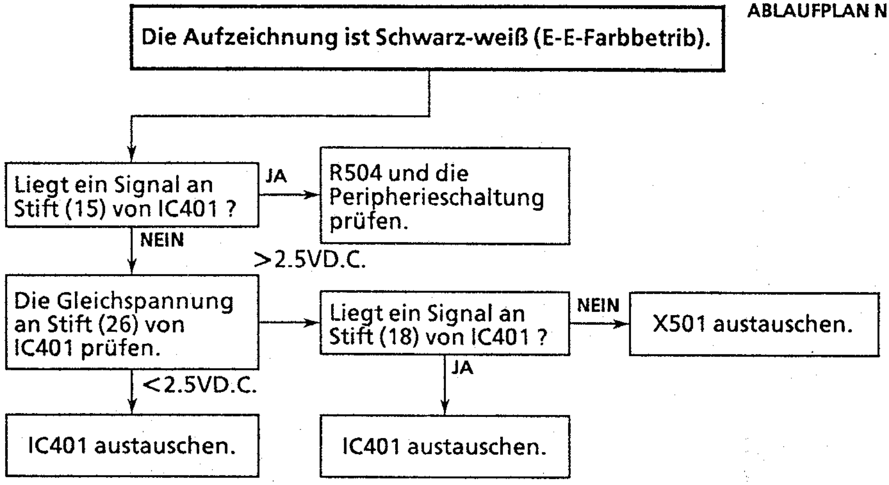
FEHLERSUCHE FÜR AUFNAHMEFUNKTION (LUMINANZ)

ABLAUFPLAN NR. 18


Keine Aufnahme.
Liegt am Stift (2) des Steckers AH ein Signal vor ?
NEIN
Liegt am TP203 ein Signal vor ?
JA
Die Peripherieschaltung von Q204 und R208 prüfen.
NEIN
Liegt am Stift (42) des IC401 ein Signal vor ?
JA
IC401 austauschen.
NEIN
Liegt am TP201 ein Signal vor ?
JA
R204, R205 und die EE(L)- Leitung überprüfen.
NEIN
Liegt am Stift (4) des IC401 ein Signal vor ?
JA
IC401 austauschen.
NEIN
Liegt am Stift (3) des IC401 ein Signal vor ?
JA
Die Peripherieschaltung von Q212~Q215 prüfen.
NEIN
IC401 austauschen.
JA
Liegt am Stift (3) des Steckers AH DC 5V vor ?
NEIN
Die BIAS CTL 9V-leitungen überprüfen.
JA
Liegt am TP301 ein Signal vor ?
NEIN
Die Verkabelung zwischen AH und XB prüfen.
IC301 austauschen.

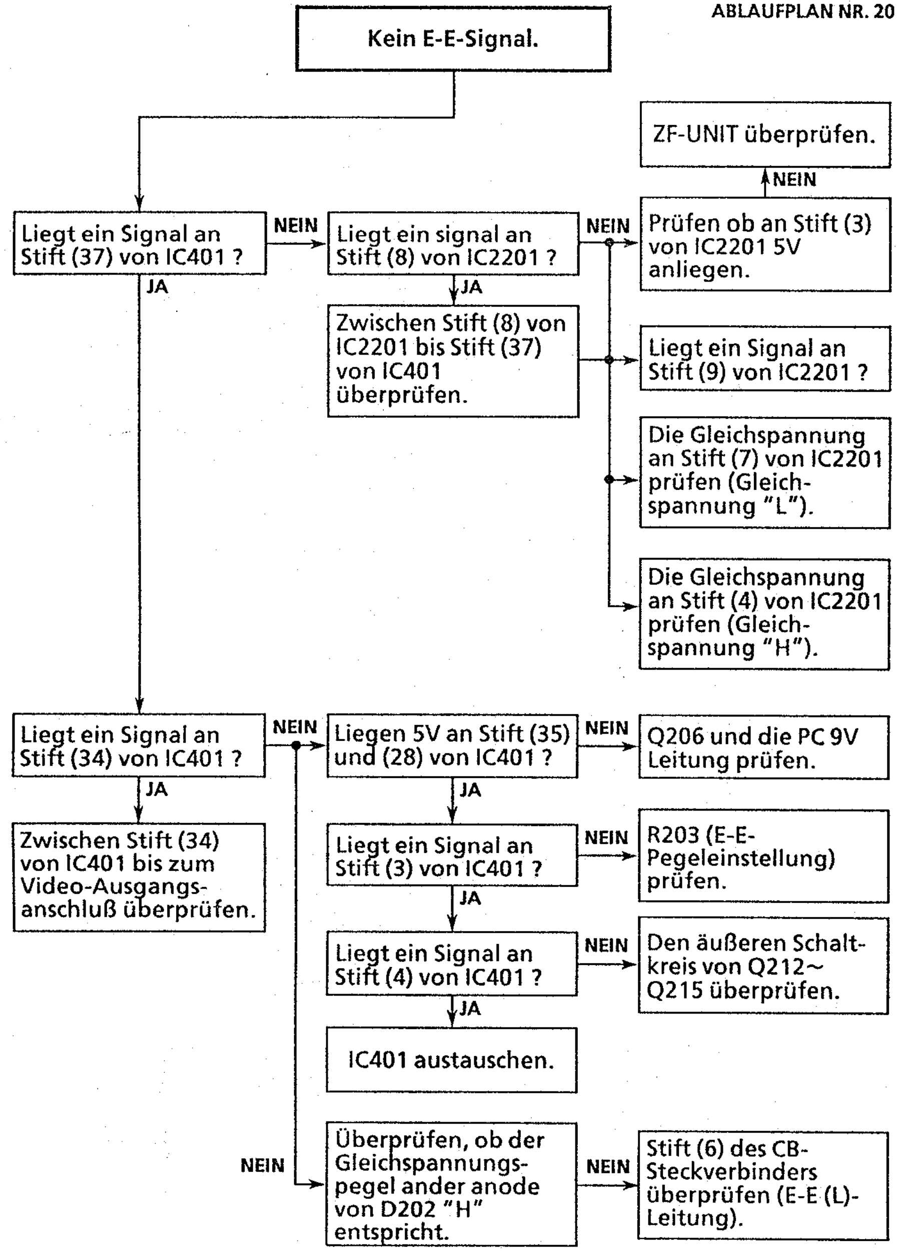
AUFNAHME (CHROMINANZ), STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 19


Die Aufzeichnung ist Schwarz-weiß (E-E-Farbbetrib).
Liegt ein Signal an Stift (15) von IC401 ?
JA
R504 und die Peripherieschaltung prüfen.
NEIN
Die Gleichspannung an Stift (26) von IC401 prüfen.
>2.5VD.C.
<2.5VD.C.
IC401 austauschen.
Liegt ein Signal an Stift (18) von IC401 ?
NEIN
X501 austauschen.
JA
IC401 austauschen.

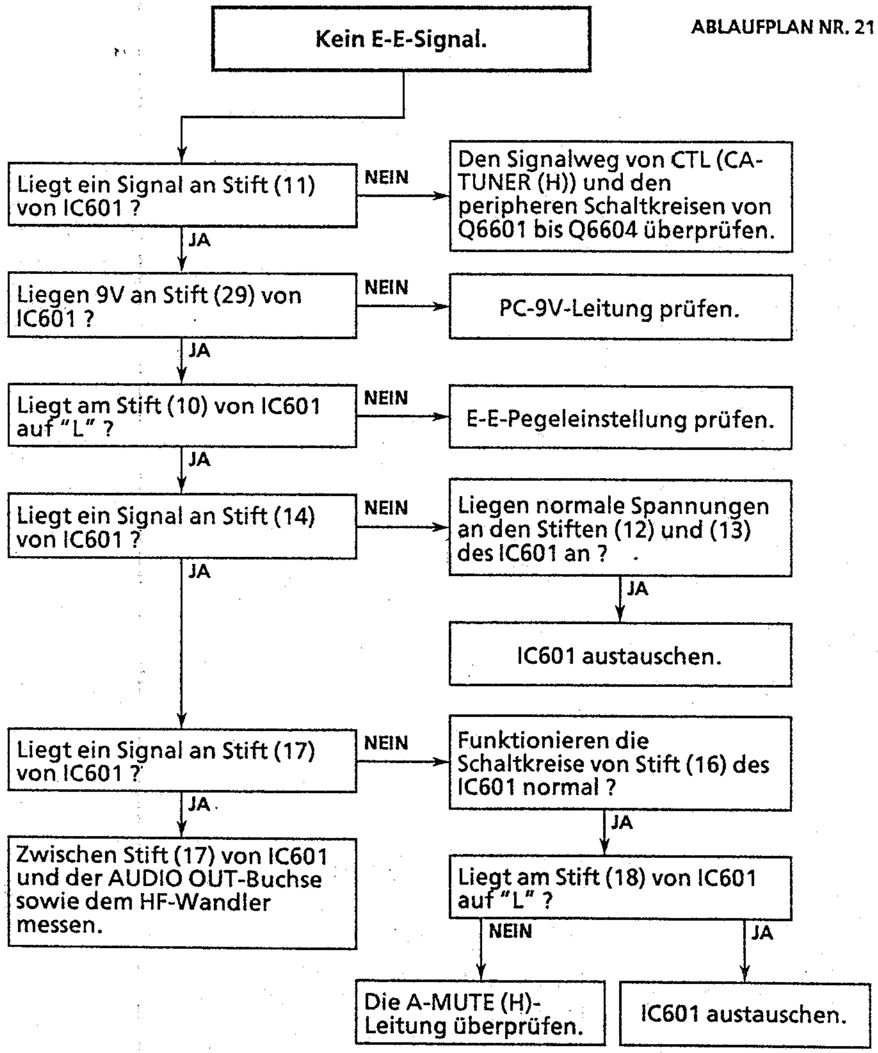
E-E-BETRIEB, STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 20


Kein E-E-Signal.
Liegt ein Signal an Stift (37) von IC401 ?
NEIN
Liegt ein signal an Stift (8) von IC2201 ?
NEIN
ZF-UNIT überprüfen.
NEIN
Prüfen ob an Stift (3) von IC2201 5V anliegen.
JA
Zwischen Stift (8) von IC2201 bis Stift (37) von IC401 überprüfen.
Liegt ein Signal an Stift (9) von IC2201 ?
Die Gleichspannung an Stift (7) von IC2201 prüfen (Gleichspannung "L").
Die Gleichspannung an Stift (4) von IC2201 prüfen (Gleichspannung "H").
JA
Liegt ein Signal an Stift (34) von IC401 ?
JA
Zwischen Stift (34) von IC401 bis zum Video-Ausgangsanschluß überprüfen.
NEIN
Liegen 5V an Stift (35) und (28) von IC401 ?
NEIN
Q206 und die PC 9V Leitung prüfen.
JA
Liegt ein Signal an Stift (3) von IC401 ?
NEIN
R203 (E-E-Pegeleinstellung) prüfen.
JA
Liegt ein Signal an Stift (4) von IC401 ?
NEIN
Den äußeren Schaltkreis von Q212~Q215 überprüfen.
JA
IC401 austauschen.
NEIN
Überprüfen, ob der Gleichspannungspegel ander anode von D202 "H" entspricht.
NEIN
Stift (6) des CB-Steckverbinders überprüfen (E-E (L)-Leitung).

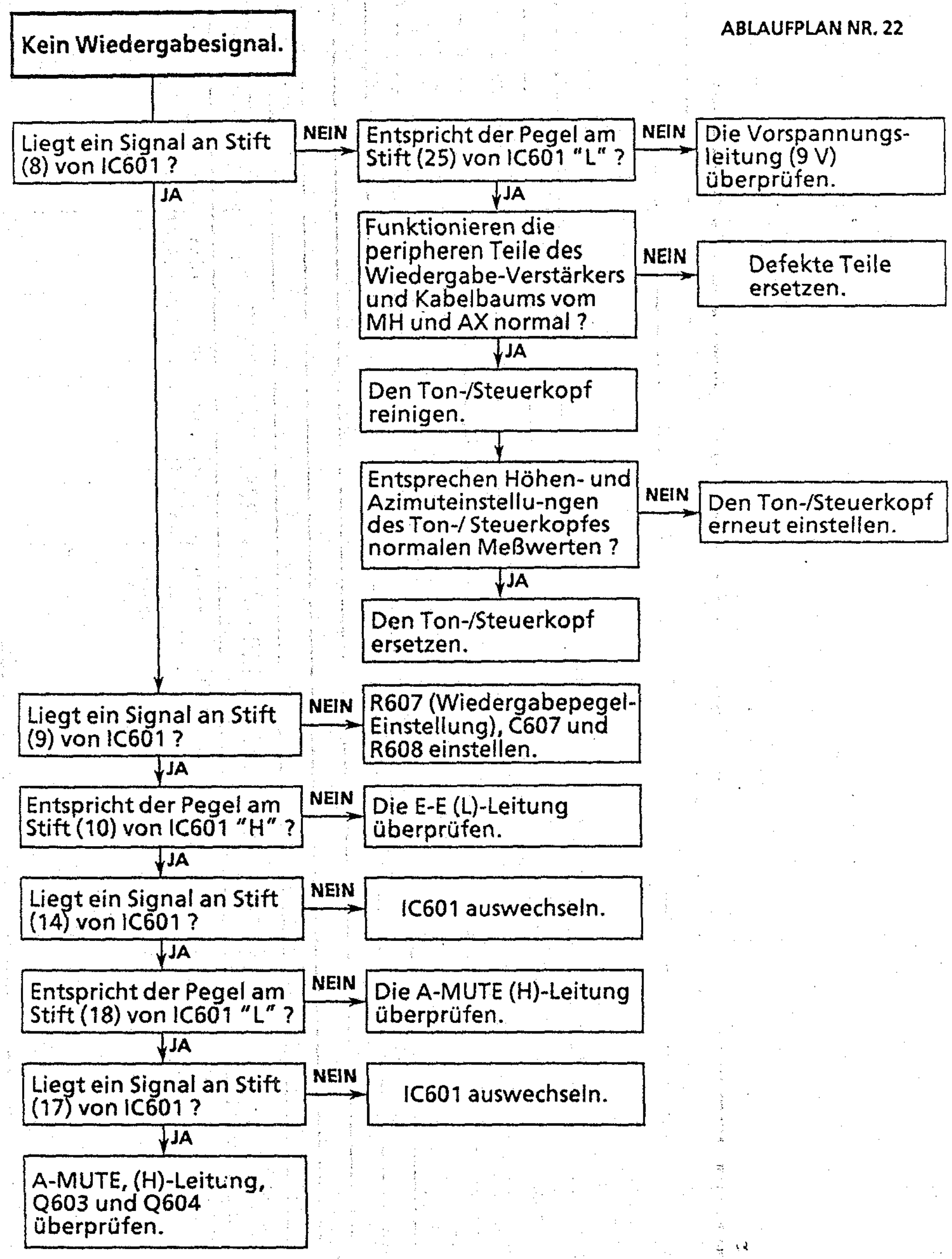
E-E-BETRIEB, STÖRUNGSBESEITIGUNG (TON)

ABLAUFPLAN NR. 21


Kein E-E-Signal.
Liegt ein Signal an Stift (11) von IC601 ?
NEIN
Den Signalweg von CTL (CA-TUNER (H)) und den peripheren Schaltkreisen von Q6601 bis Q6604 überprüfen.
JA
Liegen 9V an Stift (29) von IC601 ?
NEIN
PC-9V-Leitung prüfen.
JA
Liegt am Stift (10) von IC601 auf "L" ?
NEIN
E-E-Pegeleinstellung prüfen.
JA
Liegt ein Signal an Stift (14) von IC601 ?
NEIN
Liegen normale Spannungen an den Stiften (12) und (13) des IC601 an ?
JA
IC601 austauschen.
JA
Liegt ein Signal an Stift (17) von IC601 ?
NEIN
Funktionieren die Schaltkreise von Stift (16) des IC601 normal ?
JA
Liegt am Stift (18) von IC601 auf "L" ?
NEIN
Die A-MUTE (H)-Leitung überprüfen.
JA
IC601 austauschen.
JA
Zwischen Stift (17) von IC601 und der AUDIO OUT-Buchse sowie dem HF-Wandler messen.

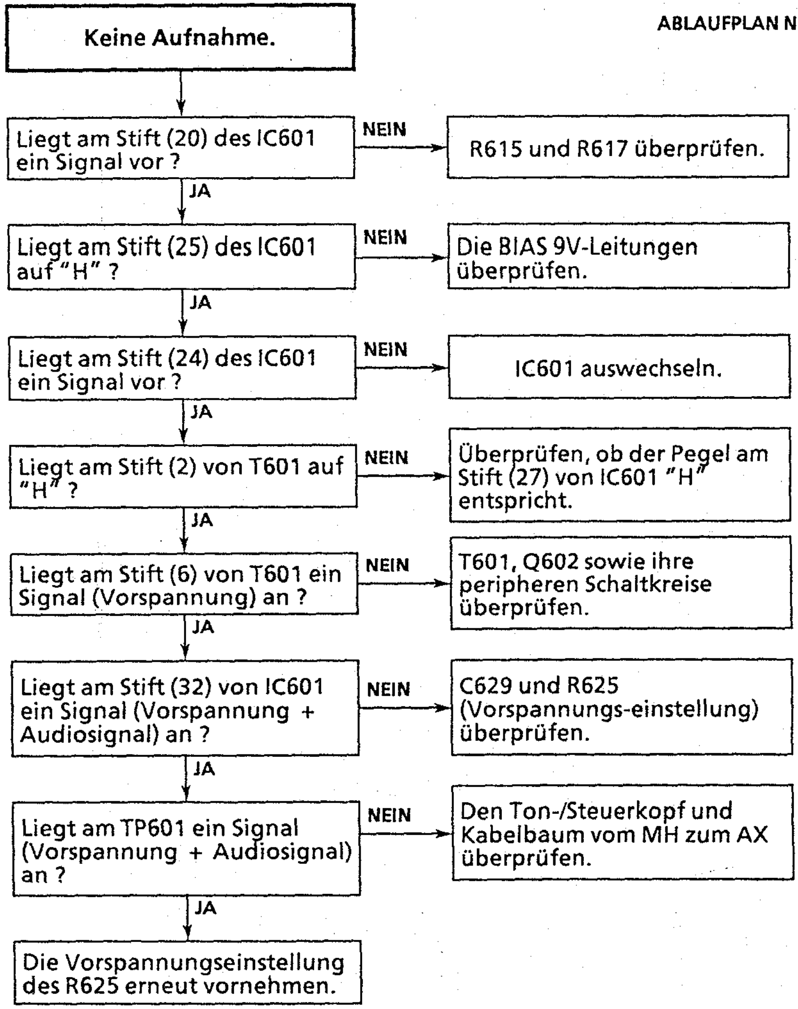
WIEDERGABE STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 22


Kein Wiedergabesignal.
Liegt ein Signal an Stift (8) von IC601 ?
NEIN
Entspricht der Pegel am Stift (25) von IC601 "L" ?
NEIN
Die Vorspannungs-leitung (9 V) überprüfen.
JA
Funktionieren die peripheren Teile des Wiedergabe-Verstärkers und Kabelbaums vom MH und AX normal ?
NEIN
Defekte Teile ersetzen.
JA
Den Ton-/Steuerkopf reinigen.
Entsprechen Höhen- und Azimuteinstellu-ngen des Ton-/ Steuerkopfes normalen Meßwerten ?
NEIN
Den Ton-/Steuerkopf erneut einstellen.
JA
Den Ton-/Steuerkopf ersetzen.
JA
Liegt ein Signal an Stift (9) von IC601 ?
NEIN
R607 (Wiedergabepegel-Einstellung), C607 und R608 einstellen.
JA
Entspricht der Pegel am Stift (10) von IC601 "H" ?
NEIN
Die E-E (L)-Leitung überprüfen.
JA
Liegt ein Signal an Stift (14) von IC601 ?
NEIN
IC601 auswechseln.
JA
Entspricht der Pegel am Stift (18) von IC601 "L" ?
NEIN
Die A-MUTE (H)-Leitung überprüfen.
JA
Liegt ein Signal an Stift (17) von IC601 ?
NEIN
IC601 auswechseln.
JA
A-MUTE, (H)-Leitung, Q603 und Q604 überprüfen.

AUFNAHME-STÖRUNGSBESEITIGUNG

ABLAUFPLAN NR. 23


Keine Aufnahme.
Liegt am Stift (20) des IC601 ein Signal vor ?
NEIN
R615 und R617 überprüfen.
JA
Liegt am Stift (25) des IC601 auf "H" ?
NEIN
Die BIAS 9V-Leitungen überprüfen.
JA
Liegt am Stift (24) des IC601 ein Signal vor ?
NEIN
IC601 auswechseln.
JA
Liegt am Stift (2) von T601 auf "H" ?
NEIN
Überprüfen, ob der Pegel am Stift (27) von IC601 "H" entspricht.
JA
Liegt am Stift (6) von T601 ein Signal (Vorspannung) an ?
NEIN
T601, Q602 sowie ihre peripheren Schaltkreise überprüfen.
JA
Liegt am Stift (32) von IC601 ein Signal (Vorspannung + Audiosignal) an ?
NEIN
C629 und R625 (Vorspannungs-einstellung) überprüfen.
JA
Liegt am TP601 ein Signal (Vorspannung + Audiosignal) an ?
NEIN
Den Ton-/Steuerkopf und Kabelbaum vom MH zum AX überprüfen.
JA
Die Vorspannungseinstellung des R625 erneut vornehmen.

AUSWECHSELN DES TIMER IC5003 (E^2PROM)

Zur Beachtung bei der Wartung

Wenn der IC5003 E^2PROM (VHIBR93C46A-1, VHIXRM9346A-1 oder VHICAT93C46-1) in der Timereinheit ausgewechselt wurde, muß die folgende Neuprogrammierung durchgeführt werden.

Je nach Modell, wurde der IC5003 E^2PROM ab Werk für seine Speicherfunktion eingestellt. Es ist daher erforderlich, die Speicherfunktion für das fragliche Modell neu ze programmieren. Der Servo-Schaltkreis erfordert Neueinstellungen für den Zeitlupen- und Standbild-Modus.

Speicherfunktion-Neuprogrammierung

1. Die OPERATE-Taste drücken, um die Spannungsversorgung einzuschalten.
2. Die TEST-Taste auf der Timer-Platine drücken, um das Gerät in den TEST-Modus zu schalten.
3. Die CH.SET-Taste drücken, um das Gerät in den CH SET-Modus zu schalten.
4. Mit den Tasten CHANNEL (+) und (−) unter Bezugnahme auf den E^2PROM-Belegungsplan die richtige Funktionsnummer aus I48 - I63 wählen, die in der Fluoreszenzröhre erscheint. Die DISPLAY-Taste drücken, um die Funktionen aufzunehmen (ON), und die CLEAR-Taste, um die Funktionen wegzulassen (OFF).
   * Wenn die DISPLAY-Taste gedrückt wurde (ON), blinkt die Speicherfunktions-Nr.
   * Wenn die CLEAR-Taste gedrücket wurde (OFF), leuchtet die Speicherfunktions-Nr.
5. Die CH SET-Taste drücken, um den CH SET-Modus zu verlassen.
6. Einen Kurzschluß zwischen der Katode des Zeitschalters D5004 und TJ203 auf der Zeitschalter-Platine verursachen, dann werden die Einstellungen in sedezimaler Darstellung angezeigt. Jetzt kann überprüft werden, ob die Einstellungen richtig sind.
   Beispiel:
   "ON" und "OFF" werden als "1" bzw. "0" angesehen. Die Nummern I48 bis I63 sind in vier Gruppen aufgeteilt, und die Einstellung jeder Grüppe wird in sedezimaler Darstellung angezeigt.

I63	I62	I61	I60	I59	I58	I57	I56	I55	I54	I53	I52	I51	I50	I49	I48
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
		⇩				⇩				⇩				⇩	
		4				2				0				0	

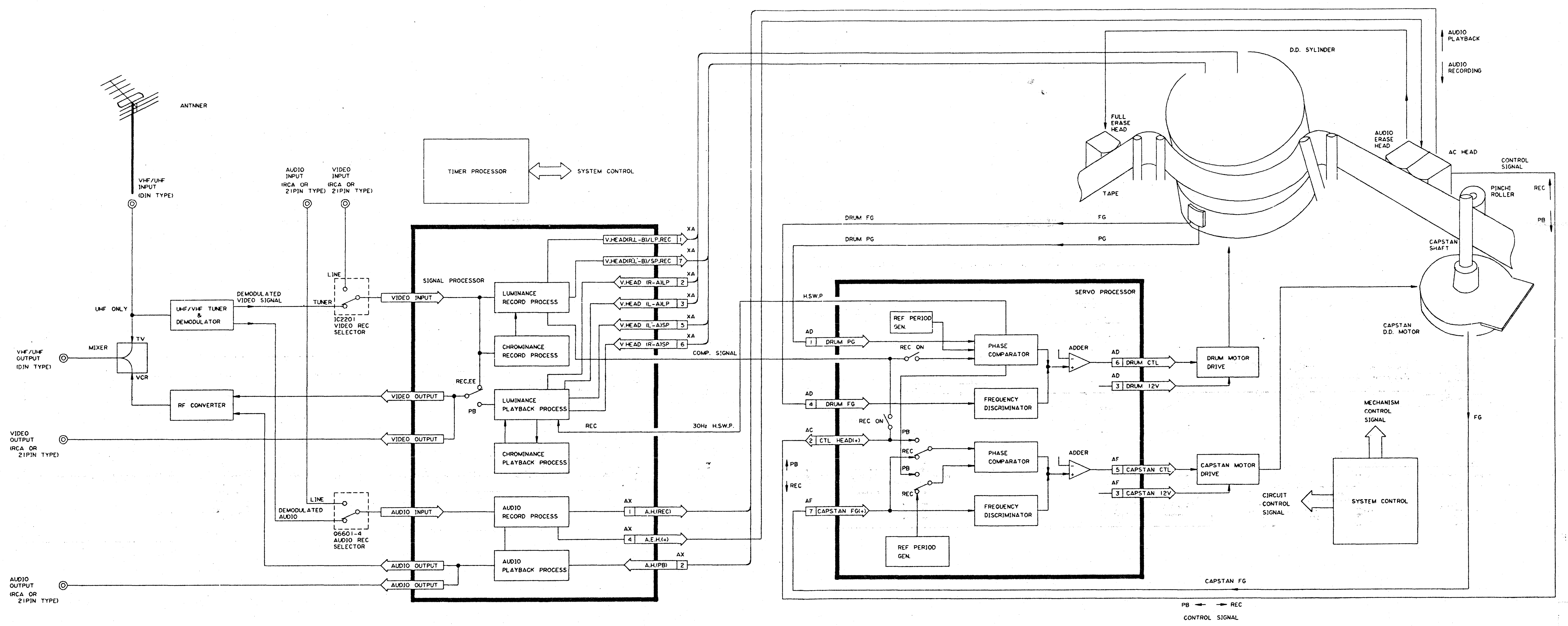
   "4200" erscheint in der Fluoreszent-Anzeigeröhre.
7. Zuletzt die ALC-Taste drücken, um den TEST-Modus zu verlassen.

E^2PROM-Speicherplan

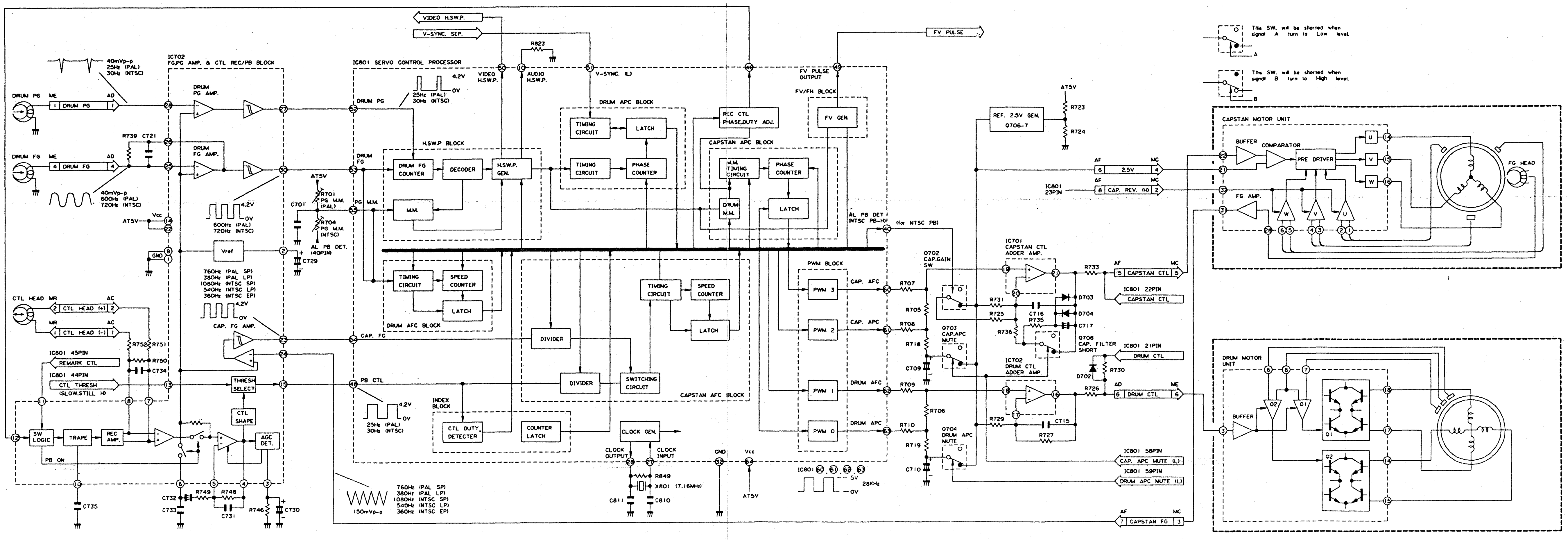
Funktions-Nr.	Funktionsbezeichnung														
I63	I^2C														
I62	SIMUL	○	○	○	○	○	○	○	○	○	○	○	○	○	○
I61	MULTI														
I60	OEM					○							○	○	
I59	COLOUR2					○							○		
I58	COLOUR1					○							○		
I57	COLOUR0	○	○	○	○		○	○	○	○	○	○		○	○
I56	GERMANY														
I55	AUX2														
I54	HYPER			○							○	○			
I53	UHF						○		○						
I52	FRENCH													○	
I51	LP							○	○	○	○	○	○	○	○
I50	VPS		○	○						○	○				
I49	Hi-Fi														
I48	VCR				○										○
Anzeige auf dem Bildschirm		4200	4204	4244	4201	5C00	4220	4208	4228	420C	424C	4248	5C08	5228	4209
Modellbezeichnungen (VC-)		A43S A43SM A33X A38X A43X A33BP A43YM A33LM	A43GM A265 GM	A43SV	A33NZ A38NZ	B34N B35D B36B	A33HM A43HM	A48X A63X A53SM A63YM A63BP A53YM	A48HM A63HM	A53GM	A63SV A63GM	A63S A63SM	B67NT B68DT	B66WT	A63NZ

Hinweis: "○" : ON " " : OFF

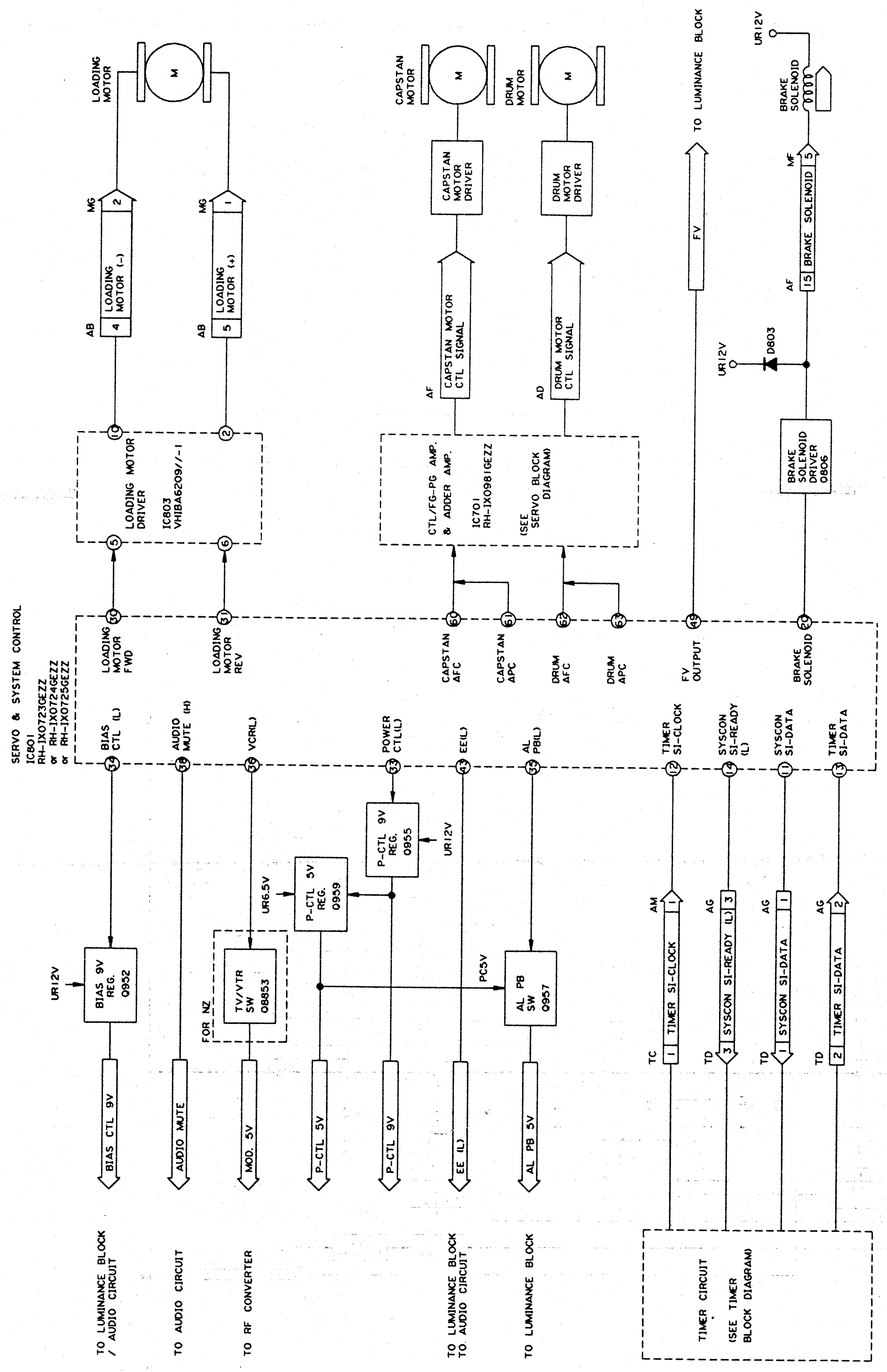
OVERALL BLOCK DIAGRAM
GESAMT-BLOCKSCHALTBILD


ANTNNER
VHF/UHF INPUT (DIN TYPE)
AUDIO INPUT (RCA OR 21PIN TYPE)
VIDEO INPUT (RCA OR 21PIN TYPE)
TIMER PROCESSOR
SYSTEM CONTROL
UHF ONLY
UHF/VHF TUNER & DEMODULATOR
DEMODULATED VIDEO SIGNAL
LINE
TUNER
IC2201 VIDEO REC SELECTOR
SIGNAL PROCESSOR
VIDEO INPUT
LUMINANCE RECORD PROCESS
CHROMINANCE RECORD PROCESS
V.HEAD(R,L-B)/LP.REC 1
V.HEAD(R,L'-B)/SP.REC 7
V.HEAD (R-A)LP 2
V.HEAD (L-A)LP 3
V.HEAD (L'-A)SP 5
V.HEAD (R'-A)SP 6
XA
COMP. SIGNAL
MIXER
TV
VCR
VHF/UHF OUTPUT (DIN TYPE)
RF CONVERTER
VIDEO OUTPUT
REC.EE
PB
LUMINANCE PLAYBACK PROCESS
REC
30Hz H.SW.P.
CHROMINANCE PLAYBACK PROCESS
VIDEO OUTPUT (RCA OR 21PIN TYPE)
DEMODULATED AUDIO
Q6601-4 AUDIO REC SELECTOR
AUDIO INPUT
AUDIO RECORD PROCESS
AX
1 A.H.(REC)
4 A.E.H.(+)
AUDIO OUTPUT
AUDIO PLAYBACK PROCESS
A.H.(PB) 2
AUDIO OUTPUT (RCA OR 21PIN TYPE)
AUDIO PLAYBACK
AUDIO RECORDING
D.D. SYLINDER
FULL ERASE HEAD
TAPE
AUDIO ERASE HEAD
AC HEAD
CONTROL SIGNAL
PINCHI ROLLER
REC
PB
CAPSTAN SHAFT
CAPSTAN D.D. MOTOR
DRUM FG
FG
DRUM PG
PG
H.SW.P
SERVO PROCESSOR
REF PERIOD GEN.
AD
1 DRUM PG
REC ON
PHASE COMPARATOR
ADDER
6 DRUM CTL
3 DRUM 12V
DRUM MOTOR DRIVE
4 DRUM FG
FREQUENCY DISCRIMINATOR
AC
2 CTL HEAD(+)
PB
REC
AF
5 CAPSTAN CTL
3 CAPSTAN 12V
CAPSTAN MOTOR DRIVE
7 CAPSTAN FG(+)
MECHANISM CONTROL SIGNAL
CIRCUIT CONTROL SIGNAL
SYSTEM CONTROL
FG
CAPSTAN FG
PB ← → REC
CONTROL SIGNAL
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

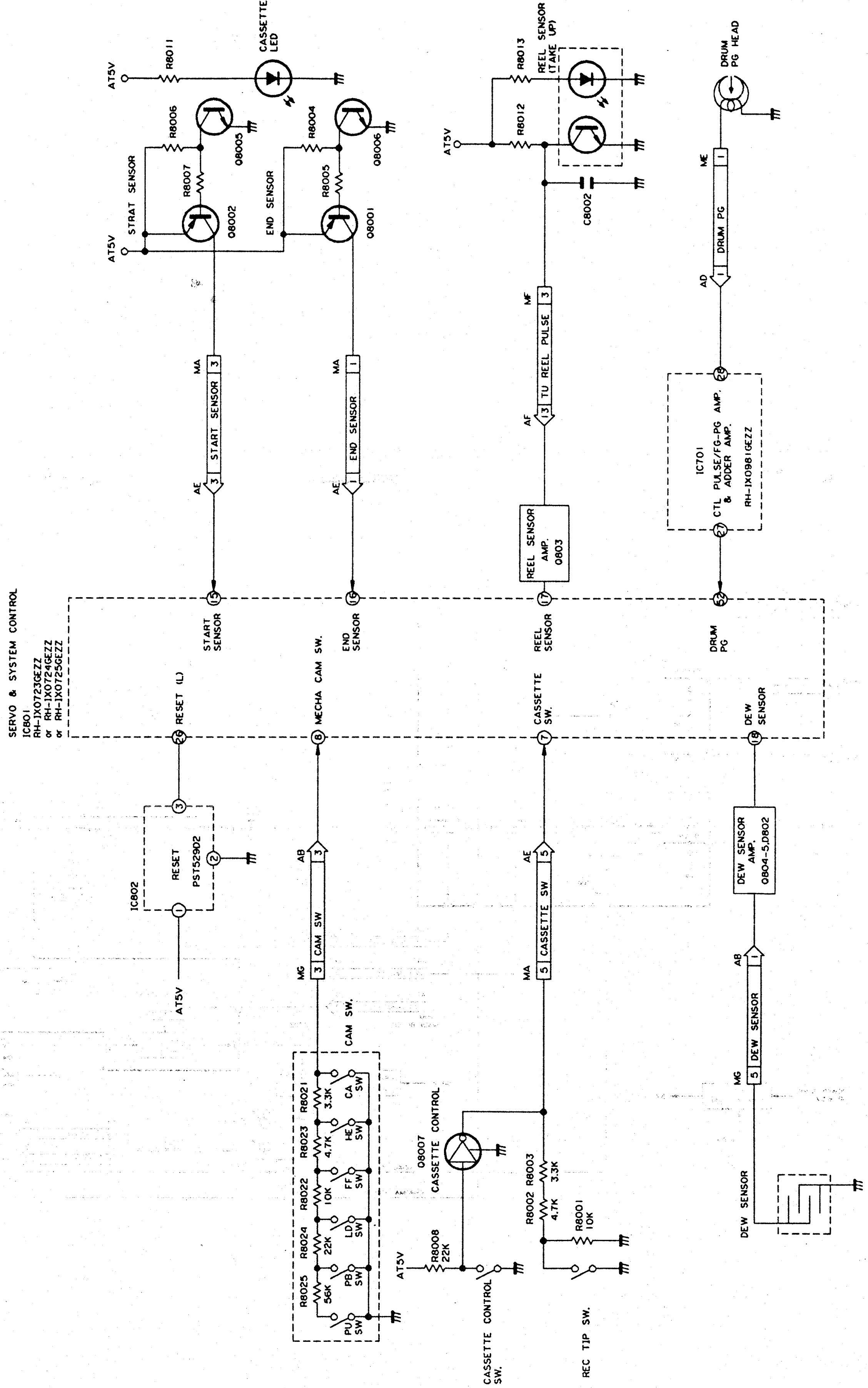
SERVO PROCESS BLOCK DIAGRAM
SERVOABLAUF-BLOCKSCHALTBILD


DRUM PG
DRUM FG
CTL HEAD
IC702 FG,PG AMP. & CTL REC/PB BLOCK
DRUM PG AMP.
DRUM FG AMP.
CAP. FG AMP.
Vref
THRESH SELECT
CTL SHAPE
AGC DET.
SW LOGIC
TRAPE
REC AMP.
PB ON
IC801 45PIN REMARK CTL
IC801 44PIN CTL THRESH (SLOW,STILL H)
IC801 SERVO CONTROL PROCESSOR
VIDEO H.SW.P.
V-SYNC. SEP.
AUDIO H.SW.P.
V-SYNC. (L)
H.SW.P. BLOCK
DRUM FG COUNTER
DECODER
H.SW.P. GEN.
M.M.
DRUM APC BLOCK
TIMING CIRCUIT
LATCH
PHASE COUNTER
REC CTL PHASE,DUTY ADJ.
CAPSTAN APC BLOCK
M.M. TIMING CIRCUIT
DRUM M.M.
FV PULSE OUTPUT
FV/FH BLOCK
FV GEN.
FV PULSE
DRUM AFC BLOCK
SPEED COUNTER
DIVIDER
SWITCHING CIRCUIT
CAPSTAN AFC BLOCK
INDEX BLOCK
CTL DUTY DETECTER
COUNTER LATCH
CLOCK GEN.
CLOCK OUTPUT
CLOCK INPUT
X801 (7.16MHz)
PWM BLOCK
PWM 3
PWM 2
PWM 1
PWM 0
CAP. AFC
CAP. APC
DRUM AFC
DRUM APC
AL PB DET (NTSC PB-H)
REF. 2.5V GEN. Q706-7
IC801 23PIN
CAP. REV. (H)
Q702 CAP.GAIN SW
Q703 CAP.APC MUTE
Q704 DRUM APC MUTE
Q708 CAP. FILTER SHORT
IC701 CAPSTAN CTL ADDER AMP.
IC702 DRUM CTL ADDER AMP.
IC801 22PIN CAPSTAN CTL
IC801 21PIN DRUM CTL
IC801 58PIN CAP. APC MUTE (L)
IC801 59PIN DRUM APC MUTE (L)
CAPSTAN FG
CAPSTAN MOTOR UNIT
BUFFER
COMPARATOR
PRE DRIVER
FG AMP.
FG HEAD
DRUM MOTOR UNIT
This SW. will be shorted when signal A turn to Low level.
This SW. will be shorted when signal B turn to High level.
40mVp-p 25Hz (PAL) 30Hz (NTSC)
40mVp-p 600Hz (PAL) 720Hz (NTSC)
760Hz (PAL SP) 380Hz (PAL LP) 1080Hz (NTSC SP) 540Hz (NTSC LP) 360Hz (NTSC EP)
150mVp-p
28KHz

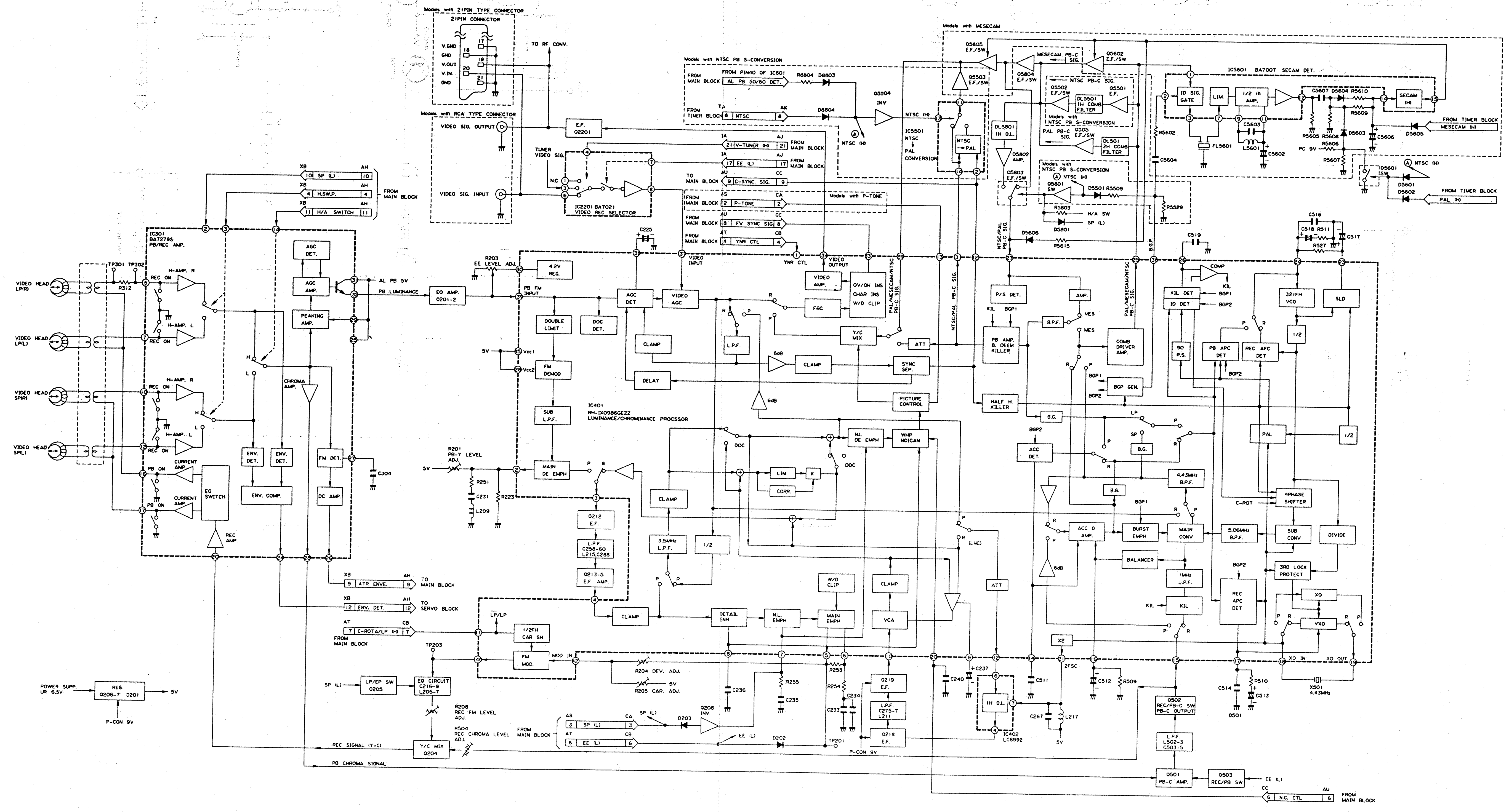
SYSTEM CONTROL BLOCK DIAGRAM
SYSTEMSTEUERUNGS-BLOCKSCHALTBILD


LOADING MOTOR
CAPSTAN MOTOR
DRUM MOTOR
TO LUMINANCE BLOCK
UR12V
BRAKE SOLENOID
CAPSTAN MOTOR DRIVER
DRUM MOTOR DRIVER
LOADING MOTOR (−)
LOADING MOTOR (+)
CAPSTAN MOTOR CTL SIGNAL
DRUM MOTOR CTL SIGNAL
FV
BRAKE SOLENOID
D803
LOADING MOTOR DRIVER IC803 VHIBA6209//-1
CTL/FG-PG AMP. & ADDER AMP. IC701 RH-IX0981GEZZ (SEE SERVO BLOCK DIAGRAM)
BRAKE SOLENOID DRIVER Q806
SERVO & SYSTEM CONTROL IC801 RH-IX0723GEZZ or RH-IX0724GEZZ or RH-IX0725GEZZ
LOADING MOTOR FWD
LOADING MOTOR REV
CAPSTAN AFC
CAPSTAN APC
DRUM AFC
DRUM APC
FV OUTPUT
BRAKE SOLENOID
BIAS CTL (L)
AUDIO MUTE (H)
VCR(L)
POWER CTL(L)
EE(L)
AL PB(L)
TIMER SI-CLOCK
SYSCON SI-READY (L)
SYSCON SI-DATA
TIMER SI-DATA
P-CTL 9V REG. Q955
P-CTL 5V REG. Q959
UR6.5V
TV/VTR SW Q8853
FOR NZ
BIAS 9V REG. Q952
AL PB SW Q957
PC5V
TIMER SI-CLOCK
SYSCON SI-READY (L)
SYSCON SI-DATA
TIMER SI-DATA
BIAS CTL 9V
AUDIO MUTE
MOD. 5V
P-CTL 5V
P-CTL 9V
EE (L)
AL PB 5V
TO LUMINANCE BLOCK / AUDIO CIRCUIT
TO AUDIO CIRCUIT
TO RF CONVERTER
TO LUMINANCE BLOCK TO AUDIO CIRCUIT
TO LUMINANCE BLOCK
TIMER CIRCUIT (SEE TIMER BLOCK DIAGRAM)
MG AB AF AD AM AG TC TD

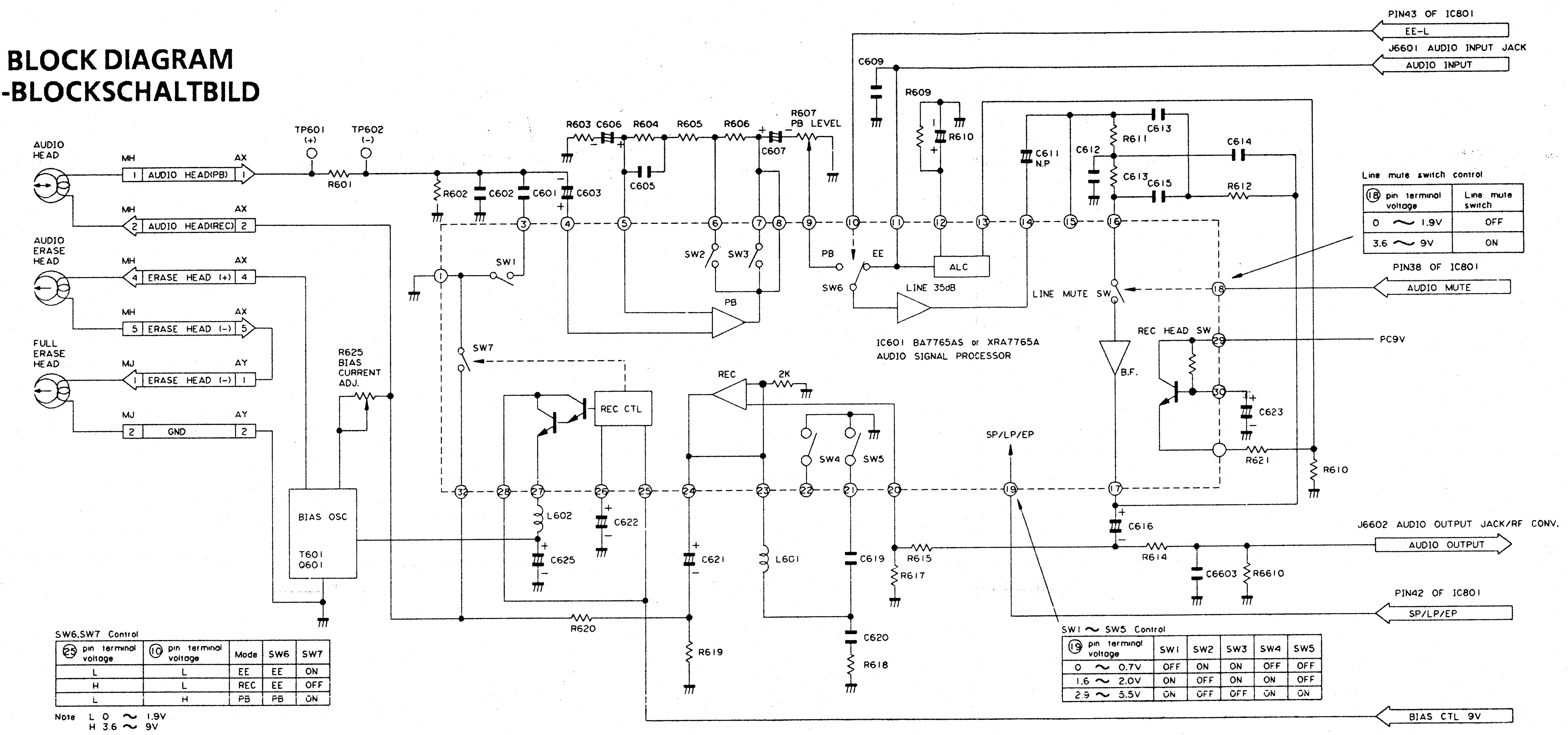
SAFETY DEVICE BLOCK DIAGRAM
SICHERHEITSEINRICHTURG-BLOCKSCHALTBILD


AT5V
R8011
CASSETTE LED
R8006
Q8003
R8004
Q8006
STRAT SENSOR
R8007
Q8002
END SENSOR
R8005
Q8001
R8013
R8012
REEL SENSOR (TAKE UP)
C8002
DRUM PG HEAD
START SENSOR
END SENSOR
TU REEL PULSE
DRUM PG
REEL SENSOR AMP. Q803
IC701 CTL PULSE/FG-PG AMP. & ADDER AMP. RH-IX0981GEZZ
SERVO & SYSTEM CONTROL IC801 RH-IX0723GEZZ or RH-IX0724GEZZ or RH-IX0725GEZZ
START SENSOR
END SENSOR
REEL SENSOR
DRUM PG
RESET (L)
MECHA CAM SW.
CASSETTE SW.
DEW SENSOR
IC802 RESET PST52902
DEW SENSOR AMP. Q804-5,Q802
CAM SW
CASSETTE SW
DEW SENSOR
CAM SW.
R8021 3.3K CA SW
R8023 4.7K HE SW
R8022 10K FF SW
R8024 22K LD SW
R8025 56K PB SW
PU SW
Q8007 CASSETTE CONTROL
R8008 22K
CASSETTE CONTROL SW.
R8002 4.7K
R8003 3.3K
R8001 10K
REC TIP SW.
DEW SENSOR
MA AE AF MF ME AD AB MG

SIGNAL FLOW BLOCK DIAGRAM
SIGNALVERLAUF-BLOCKSCHALTBILD


Models with 21PIN TYPE CONNECTOR
21PIN CONNECTOR
V.GND
GND
V.OUT
V.IN
TO RF CONV.
Models with RCA TYPE CONNECTOR
VIDEO SIG. OUTPUT
VIDEO SIG. INPUT
E.F. Q2201
TUNER VIDEO SIG.
IC2201 BA7021 VIDEO REC SELECTOR
Models with NTSC PB S-CONVERSION
FROM MAIN BLOCK
FROM PIN40 OF IC801
AL PB 50/60 DET.
FROM TIMER BLOCK
NTSC
Q5504 INV
IC5501 NTSC PAL CONVERSION
Models with MESECAM
Q5605 E.F./SW
Q5503 E.F./SW
MESECAM PB-C SIG.
Q5602 E.F./SW
Q5604 E.F./SW
NTSC PB-C SIG.
Q5502 E.F./SW
Q5501 E.F.
DL5501 1H COMB FILTER
DL501 2H COMB FILTER
DL5801 1H D.L.
Q5802 AMP.
Q5803 E.F./SW
Q5801 SW
IC5601 BA7007 SECAM DET.
1D SIG. GATE
LIM.
1/2 fH AMP.
SECAM (H)
FROM TIMER BLOCK MESECAM (H)
FROM TIMER BLOCK PAL (H)
Q5601 SW
V-TUNER (H)
EE (L)
C-SYNC. SIG.
P-TONE
FV SYNC SIG
YNR CTL
TO MAIN BLOCK
FROM MAIN BLOCK
SP (L)
H.SW.P.
H/A SWITCH
IC301 BA7279S PB/REC AMP.
VIDEO HEAD LP(R)
VIDEO HEAD LP(L)
VIDEO HEAD SP(R)
VIDEO HEAD SP(L)
TP301 TP302
R312
REC ON
H-AMP. R
H-AMP. L
PB ON
CURRENT AMP
EQ SWITCH
REC AMP
AGC DET.
AGC AMP.
PEAKING AMP.
CHROMA AMP.
ENV. DET.
ENV. COMP.
FM DET.
DC AMP.
AL PB 5V
PB LUMINANCE
EQ AMP. Q201-2
R203 EE LEVEL ADJ.
4.2V REG.
PB FM INPUT
AGC DET
VIDEO AGC
VIDEO INPUT
VIDEO OUTPUT
VIDEO AMP.
OV/OH INS CHAR INS W/D CLIP
FBC
Y/C MIX
ATT
SYNC SEP.
PICTURE CONTROL
DOUBLE LIMIT
DOC DET.
FM DEMOD
CLAMP
DELAY
L.P.F.
SUB L.P.F.
MAIN DE EMPH
IC401 RH-IX0986GEZZ LUMINANCE/CHROMINANCE PROCESSOR
R201 PB-Y LEVEL ADJ.
R251 C231 L209 R223
Q212 E.F.
L.P.F. C258-60 L215,C288
Q213-5 E.F. AMP
N.L. DE EMPH
WHP NOICAN
LIM
CORR.
3.5MHz L.P.F.
1/2
DETAIL ENH
N.L. EMPH
MAIN EMPH
W/D CLIP
VCA
ATR ENVE.
ENV. DET.
TO SERVO BLOCK
C-ROTA/LP (H)
1/2FH CAR SH
FM MOD.
MOD IN
R204 DEV. ADJ.
R205 CAR. ADJ.
TP203
EQ CIRCUIT C216-9 L205-7
LP/EP SW Q205
R208 REC FM LEVEL ADJ.
R504 REC CHROMA LEVEL ADJ.
Y/C MIX Q204
REC SIGNAL (Y+C)
PB CHROMA SIGNAL
POWER SUPP. UR 6.5V
REG. Q206-7 Q201
P-CON 9V
D203 INV. Q208
EE (L) D202
Q219 E.F.
L.P.F. C275-7 L211
Q218 E.F.
TP201
IC402 LC8992 1H D.L.
P/S DET.
PB AMP. & DEEM KILLER
HALF H. KILLER
B.P.F.
COMB DRIVER AMP.
BGP GEN.
KIL DET
ID DET
90 P.S.
PB APC DET
REC AFC DET
321fH VCO
SLD
PAL
4.43MHz B.P.F.
ACC DET
B.G.
4PHASE SHIFTER
ACC D AMP.
BURST EMPH
MAIN CONV
5.06MHz B.P.F.
SUB CONV
DIVIDE
BALANCER
3RD LOCK PROTECT
1MHz L.P.F.
KIL
REC APC DET
XO
VXO
X2
2fSC
XO IN
XO OUT
X501 4.43MHz
Q502 REC/PB-C SW PB-C OUTPUT
L.P.F. L502-3 C503-5
Q501 PB-C AMP.
Q503 REC/PB SW
N.C. CTL
FROM MAIN BLOCK

AUDIO BLOCK DIAGRAM
AUDIO-BLOCKSCHALTBILD


PIN43 OF IC801
EE-L
J6601 AUDIO INPUT JACK
AUDIO INPUT
AUDIO HEAD
MH
AX
1 AUDIO HEAD(PB) 1
2 AUDIO HEAD(REC) 2
AUDIO ERASE HEAD
4 ERASE HEAD (+) 4
5 ERASE HEAD (-) 5
FULL ERASE HEAD
MJ
AY
1 ERASE HEAD (-) 1
2 GND 2
TP601 (+)
TP602 (-)
R601
R602
C602
C601
C603
R603 C606 R604 R605 R606
C605
R607 PB LEVEL
C607
C609
R609
R610
C611 N.P
C612
R611
C613
C615
C614
R612
SW1
SW2
SW3
PB
EE
SW6
ALC
LINE 35dB
IC601 BA7765AS or XRA7765A
AUDIO SIGNAL PROCESSOR
LINE MUTE SW
PIN38 OF IC801
AUDIO MUTE
REC HEAD SW
PC9V
B.F.
C623
R621
R610
SW7
R625 BIAS CURRENT ADJ.
REC CTL
REC
2K
SW4
SW5
SP/LP/EP
BIAS OSC
T601 Q601
L602
C625
C622
C621
L601
C619
R615
R617
C616
R614
C6603
R6610
J6602 AUDIO OUTPUT JACK/RF CONV.
AUDIO OUTPUT
PIN42 OF IC801
SP/LP/EP
R620
R619
C620
R618
BIAS CTL 9V

Line mute switch control

⑱ pin terminal voltage	Line mute switch
0 ~ 1.9V	OFF
3.6 ~ 9V	ON

SW6,SW7 Control

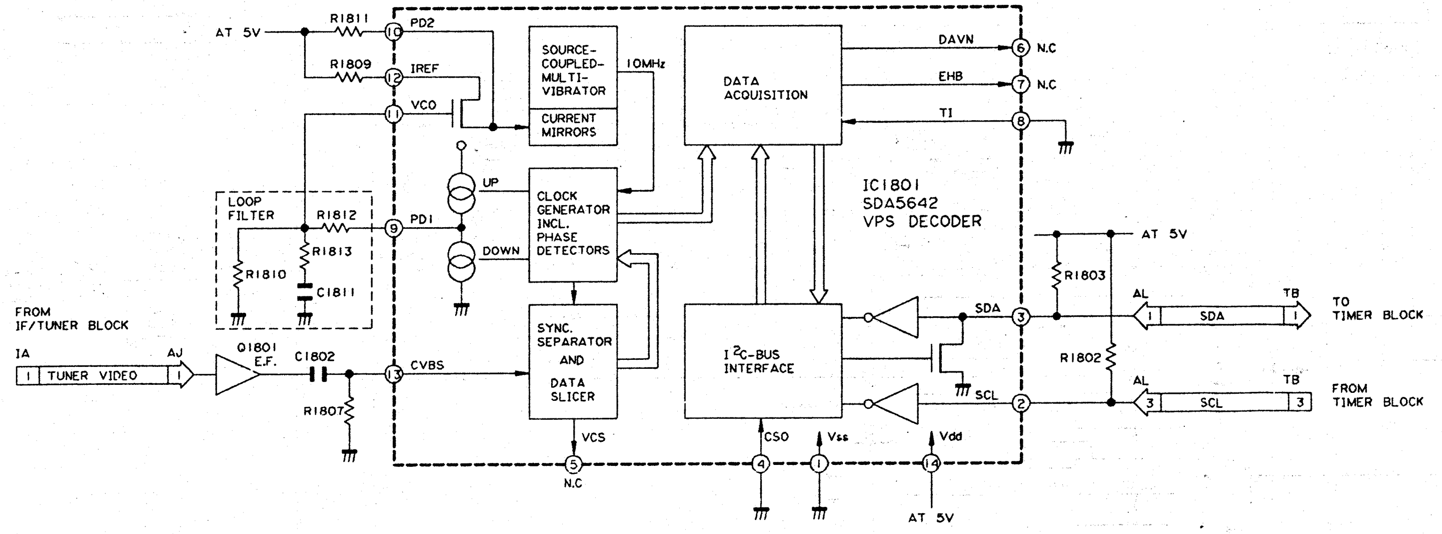
㉕ pin terminal voltage	⑩ pin terminal voltage	Mode	SW6	SW7
L	L	EE	EE	ON
H	L	REC	EE	OFF
L	H	PB	PB	ON

Note L 0 ~ 1.9V
H 3.6 ~ 9V

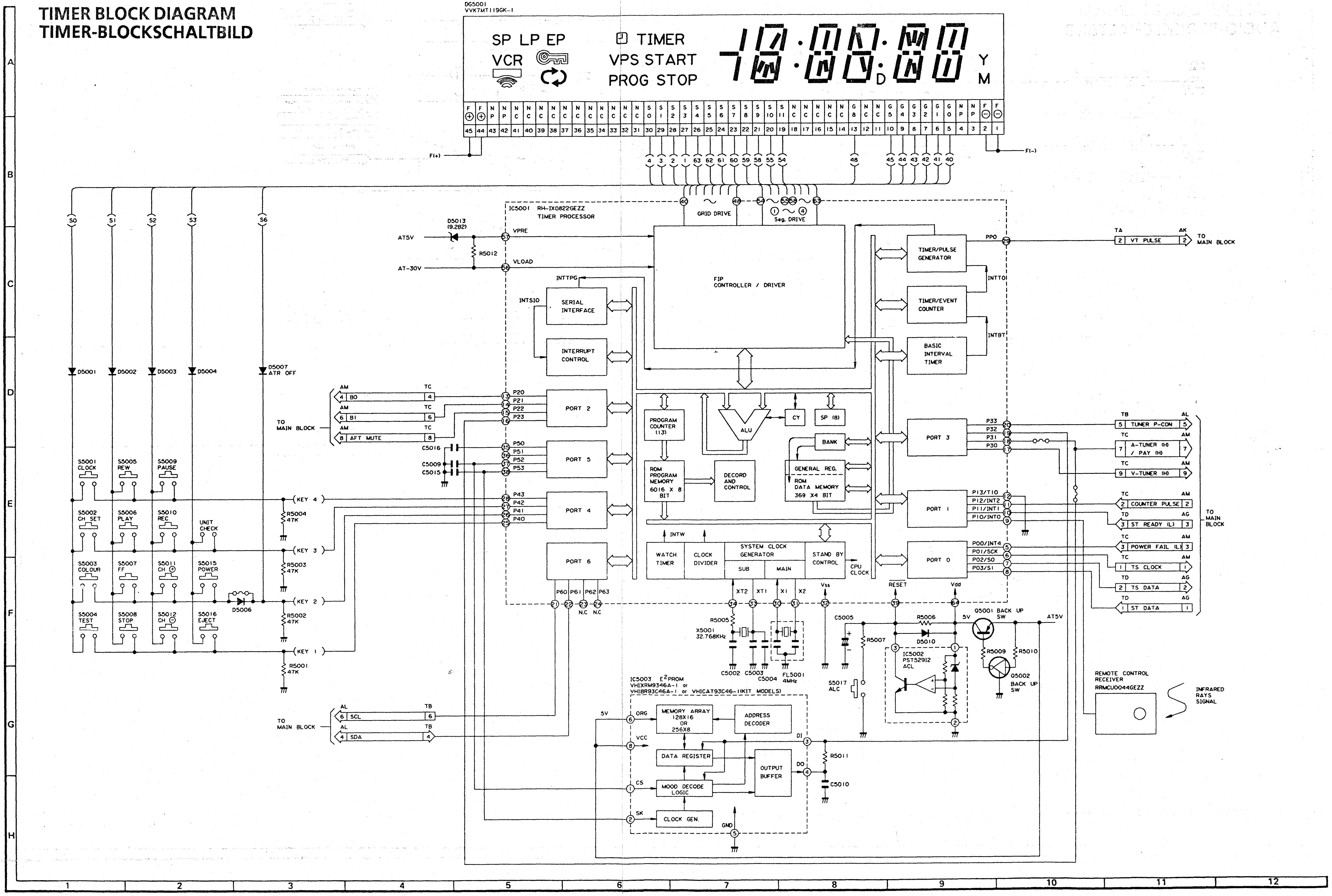
SW1 ~ SW5 Control

⑲ pin terminal voltage	SW1	SW2	SW3	SW4	SW5
0 ~ 0.7V	OFF	ON	ON	OFF	OFF
1.6 ~ 2.0V	ON	OFF	ON	ON	OFF
2.9 ~ 5.5V	ON	OFF	OFF	ON	ON

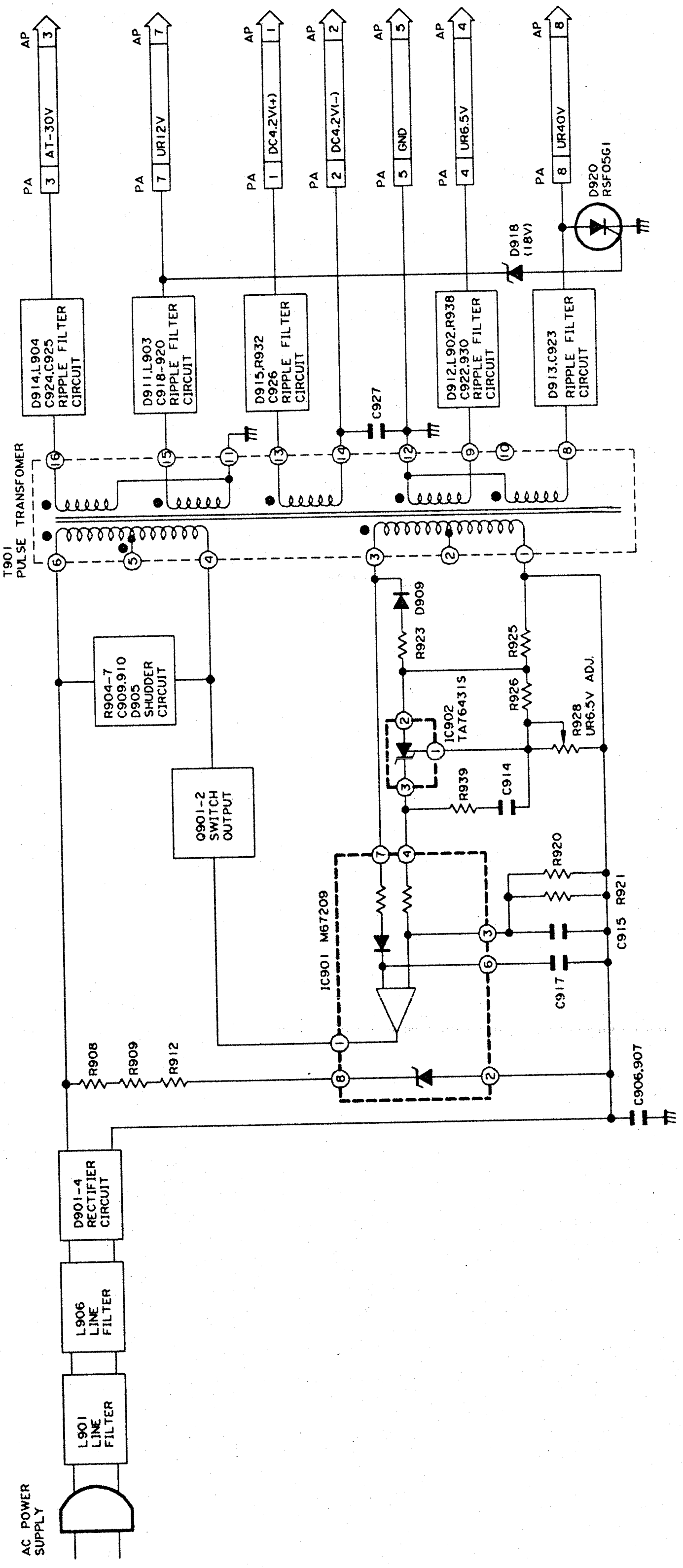
VPS-DECODER BLOCK DIAGRAM
VPS-DEKODIERER-BLOCKSCHALTBILD


AT 5V
R1811
R1809
PD2
IREF
VCO
SOURCE-COUPLED-MULTI-VIBRATOR
CURRENT MIRRORS
10MHz
DATA ACQUISITION
DAVN
EHB
TI
N.C
N.C
UP
DOWN
LOOP FILTER
R1812
R1813
R1810
C1811
PD1
CLOCK GENERATOR INCL. PHASE DETECTORS
IC1801
SDA5642
VPS DECODER
AT 5V
R1803
FROM IF/TUNER BLOCK
IA
AJ
1 TUNER VIDEO 1
Q1801 E.F.
C1802
R1807
CVBS
SYNC. SEPARATOR AND DATA SLICER
I²C-BUS INTERFACE
SDA
SCL
R1802
AL
TB
1 SDA 1
3 SCL 3
TO TIMER BLOCK
FROM TIMER BLOCK
VCS
N.C
CSO
Vss
Vdd
AT 5V

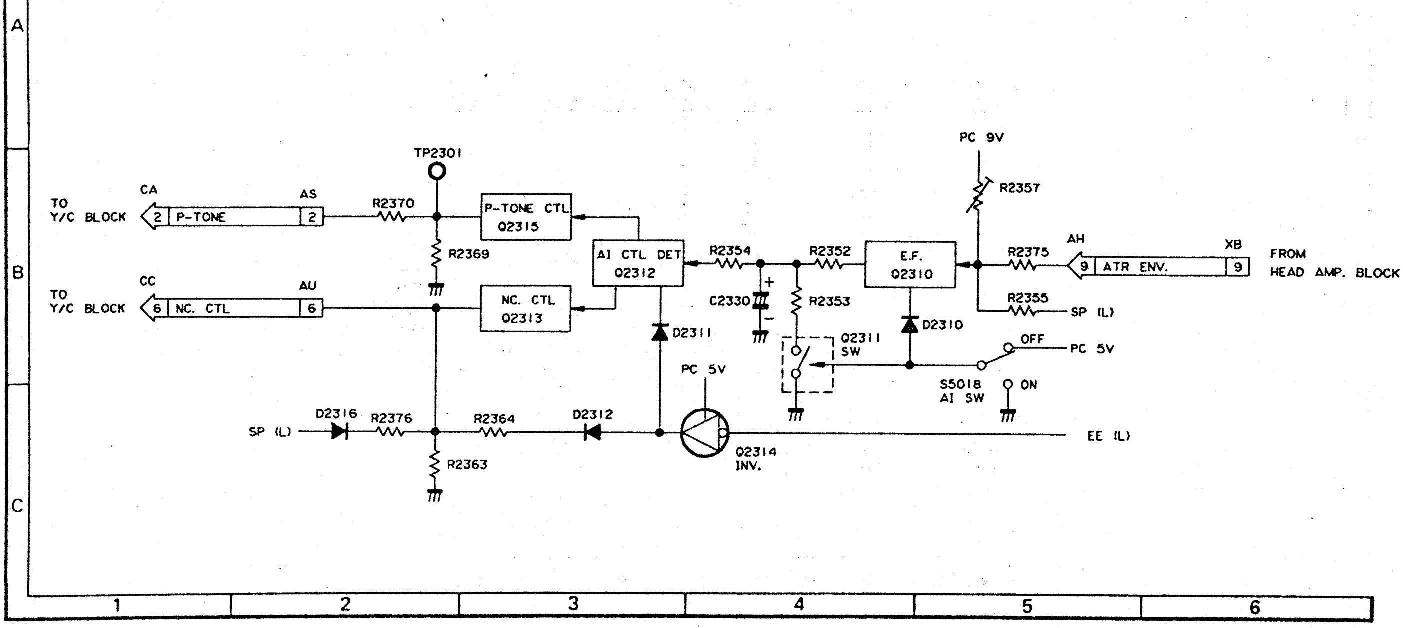
TIMER BLOCK DIAGRAM
TIMER-BLOCKSCHALTBILD


DG5001
VVK7MT119GK-1
SP LP EP
VCR
TIMER
VPS START
PROG STOP
Y
M
D
F(+)
F(-)
IC5001 RH-IX0822GEZZ
TIMER PROCESSOR
GRID DRIVE
Seg. DRIVE
D5013
AT5V
AT-30V
R5012
VPRE
VLOAD
INTTPG
INTSIO
SERIAL INTERFACE
INTERRUPT CONTROL
FIP CONTROLLER / DRIVER
TIMER/PULSE GENERATOR
TIMER/EVENT COUNTER
BASIC INTERVAL TIMER
INTTO
INTBT
PPO
PORT 2
PORT 5
PORT 4
PORT 6
PORT 3
PORT 1
PORT 0
PROGRAM COUNTER (13)
ALU
CY
SP (8)
BANK
GENERAL REG.
ROM PROGRAM MEMORY 6016 X 8 BIT
DECORD AND CONTROL
ROM DATA MEMORY 369 X4 BIT
INTW
WATCH TIMER
CLOCK DIVIDER
SYSTEM CLOCK GENERATOR
SUB
MAIN
STAND BY CONTROL
CPU CLOCK
P20
P21
P22
P23
P50
P51
P52
P53
P43
P42
P41
P40
P60
P61
P62
P63
N.C
P33
P32
P31
P30
P13/TI0
P12/INT2
P11/INT1
P10/INT0
P00/INT4
P01/SCK
P02/SO
P03/SI
XT2
XT1
X1
X2
Vss
RESET
Vdd
S0
S1
S2
S3
S6
D5001
D5002
D5003
D5004
D5007
ATR OFF
S5001 CLOCK
S5005 REW
S5009 PAUSE
S5002 CH SET
S5006 PLAY
S5010 REC
UNIT CHECK
S5003 COLOUR
S5007 FF
S5011 CH ⊕
S5015 POWER
S5004 TEST
S5008 STOP
S5012 CH ⊖
S5016 EJECT
D5006
KEY 4
KEY 3
KEY 2
KEY 1
R5004 47K
R5003 47K
R5002 47K
R5001 47K
C5016
C5009
C5015
TO MAIN BLOCK
AM
TC
B0
B1
AFT MUTE
TA
AK
VT PULSE
TB
AL
TUNER P-CON
A-TUNER (H) / PAY (H)
V-TUNER (H)
COUNTER PULSE
TD
AG
ST READY (L)
POWER FAIL (L)
TS CLOCK
TS DATA
ST DATA
R5005
X5001 32.768KHz
C5002
C5003
C5004
FL5001 4MHz
C5005
R5006
D5010
R5007
Q5001 BACK UP SW
5V
R5009
R5010
Q5002 BACK UP SW
IC5002 PST52912 ACL
S5017 ALC
REMOTE CONTROL RECEIVER
RRMCU0044GEZZ
INFRARED RAYS SIGNAL
IC5003 E²PROM
VHIXRM9346A-1 or
VHIBR93C46A-1 or VHICAT93C46-1(KIT MODELS)
SCL
SDA
ORG
VCC
CS
SK
GND
DI
DO
MEMORY ARRAY 128X16 OR 256X8
ADDRESS DECODER
DATA REGISTER
MOOD DECODE LOGIC
OUTPUT BUFFER
CLOCK GEN.
R5011
C5010
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

POWER CIRCUIT BLOCK DIAGRAM
LEISTUNGSKREIS-BLOCKSCHALTBILD

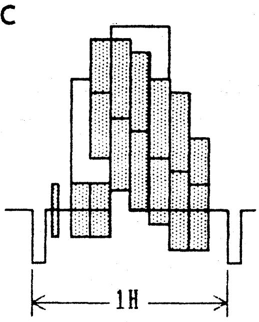

AP
PA
3 AT-30V
7 UR12V
1 DC4.2V(+)
2 DC4.2V(–)
5 GND
4 UR6.5V
8 UR40V
D920 RSF05G1
D918 (18V)
D914,L904 C924,C925 RIPPLE FILTER CIRCUIT
D911,L903 C918-920 RIPPLE FILTER CIRCUIT
D915,R932 C926 RIPPLE FILTER CIRCUIT
D912,L902,R938 C922,930 RIPPLE FILTER CIRCUIT
D913,C923 RIPPLE FILTER CIRCUIT
C927
T901 PULSE TRANSFOMER
D909
R923
R925
R926
R928 UR6.5V ADJ.
IC902 TA76431S
R939
C914
R904-7 C909,910 D905 SHUDDER CIRCUIT
Q901-2 SWITCH OUTPUT
IC901 M67209
R920
R921
C915
C917
R908
R909
R912
C906,907
D901-4 RECTIFIER CIRCUIT
L906 LINE FILTER
L901 LINE FILTER
AC POWER SUPPLY

AUTO PICTURE CONTROL BLOCK DIAGRAM
AUTOMATISCHEN BILDSTEUERUNG-BLOCKSCHALTBILD


A
B
C
1
2
3
4
5
6
TO Y/C BLOCK
CA
2
P-TONE
AS
2
R2370
TP2301
R2369
P-TONE CTL Q2315
TO Y/C BLOCK
CC
6
NC. CTL
AU
6
NC. CTL Q2313
AI CTL DET Q2312
R2354
C2330
R2352
R2353
E.F. Q2310
PC 9V
R2357
R2375
AH
9
ATR ENV.
XB
9
FROM HEAD AMP. BLOCK
R2355
SP (L)
D2310
D2311
Q2311 SW
OFF
PC 5V
S5018 AI SW
ON
PC 5V
SP (L)
D2316
R2376
R2364
D2312
R2363
Q2314 INV.
EE (L)

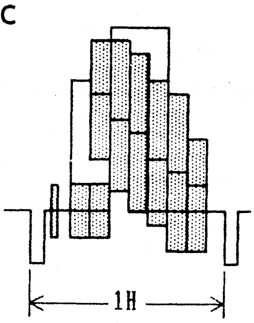
WAVEFORMS/WELLENFORMEN

Y/C



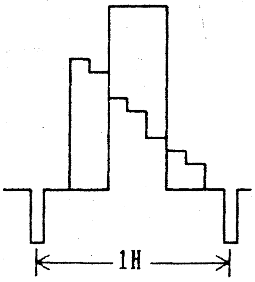
V:1.0Vp-p
IC401 PIN37 REC/EE
V:1,0Vs-s
STIFT 37 DES IC201
AUFZEICHNUNG/EE

Y/C



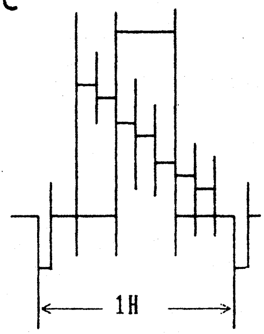
V:2.0Vp-p
IC401 PIN34 REC/PB
V:2,0Vs-s
STIFT 34 DES IC401
AUFZEICHNUNG/
WIEDERGABE

Y/C



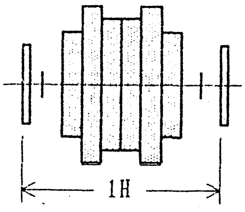
V:540mVp-p REC/EE
V:550mVp-p PB
IC401 PIN4
V:540mVs-s
AUFZEICHNUNG/EE
V:550mVs-s
WIEDERGABE
STIFT 4 DES IC401

Y/C



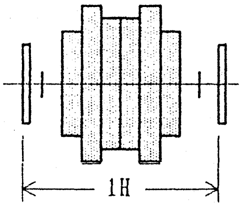
V:500mVp-p
TP201 REC/EE
V:500mVs-s
TP201
AUFZEICHNUNG/EE

Y/C



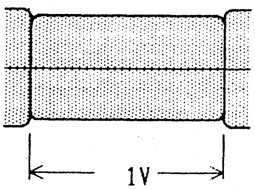
V:370mVp-p REC/EE
V:150mVp-p PB
IC401 PIN15
V:370mVs-s
AUFZEICHNUNG/EE
V:150mVs-s
WIEDERGABE
STIFT 15 DES IC401

Y/C



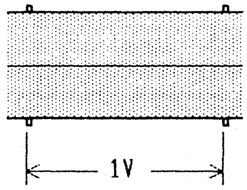
V:400mVp-p
IC401 PIN29 PB
V:400mVs-s
STIFT 29 DES IC401
WIEDERGABE

Y/C



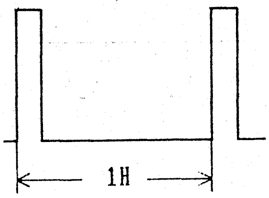
V:250mVp-p
IC401 PIN39 PB
V:250mVs-s
STIFT 39 DES IC401
WIEDERGABE

Y/C



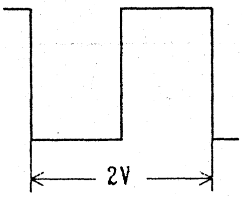
V:1Vp-p
TP203 REC
V:1Vs-s
TP203
AUFZEICHNUNG

Y/C



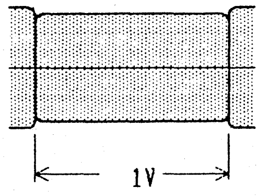
V:4.3Vp-p
IC401 PIN32
COMPOSITE SYNC.
V:4,3Vs-s
STIFT 32 DES IC401
BILDAUSTASTSYNCRON

Y/C



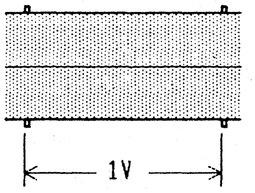
V:1.1Vp-p
IC401 PIN41
CHROMA ROTATION
V:1,1Vs-s
STIFT 41 DES IC401
CHROMA ROTATION

H/A



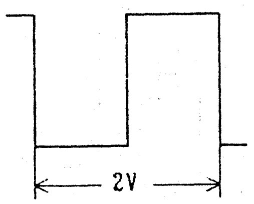
V:300mVp-p (SP)
V:200mVp-p (LP)
XB CONNECTOR PIN6 PB
AH CONNECTOR PIN6
V:300mVs-s (SP)
V:200mVs-s (LP)
STIFT 6 DES ANSCHLUß XB
WIEDERGABE
STIFT 6 DES ANSCHLUß AH

H/A



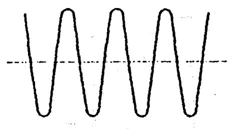
V:100mVp-p (SP)
V:80mVp-p (LP)
XB CONNECTOR PIN2 REC
AH CONNECTOR PIN2
V:100mVs-s (SP)
V:80mVs-s (LP)
STIFT 2 DES ANSCHLUß XB
AUFZEICHNUNG
STIFT 2 DES ANSCHLUß AH

H/A



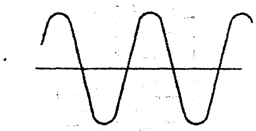
V:4.3Vp-p
HEAD SWITCHING PULSE
AH CONNECTOR PIN4
XB CONNECTOR PIN4
V:4,3Vs-s
KOPFUMSCHALTIMUS
STIFT 4 DES ANSCHLUß AH
STIFT 4 DES ANSCHLUß XB

SERVO



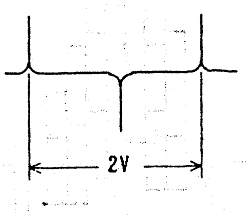
H:760Hz (PAL SP)
V:150mVp-p
AF CONNECTOR PIN6
PB/REC
H:760Hz (PAL SP)
V:150mVs-s
STIFT 6 ANSCHLUß AF
WIEDERGABE/
AUFZEICHNUNG

SERVO



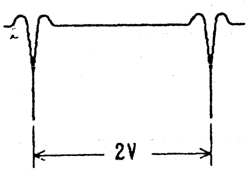
H:600Hz (PAL)
V:40mVp-p
AD CONNECTOR PIN4
PB/REC
H:600Hz (PAL)
V:40mVs-s
STIFT 4 DES ANSCHLUß AD
WIEDERGABE/
AUFZEICHNUNG

SERVO



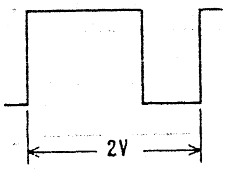
V:1.1Vp-p (SP MODE)
IC701 PIN4 PB
V:1,1Vs-s
(SP-BETRIEBSART)
STIFT 4 DES IC701
WIEDERGABE

SERVO



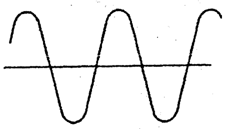
H:25Hz (PAL)
V:40mVp-p
AD CONNECTOR PIN1 PB
H:25Hz (PAL)
V:40mVs-s
STIFT 1 DES ANSCHLUß AD
WIEDERGABE

SERVO



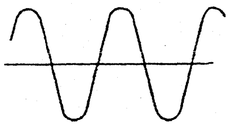
H:25Hz (PAL)
V:4.2Vp-p
IC701 PIN15 PB
H:25Hz (PAL)
V:4,2Vs-s
STIFT 15 DES IC701
WIEDERGABE

AUDIO



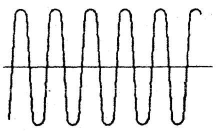
H:1kHz
V:38mVp-p
IC601 PIN11 REC/ EE
H:1kHz
V:38mVs-s
STIFT 11 DES IC601
AUFZEICHNUNG/EE

AUDIO



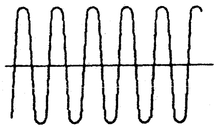
H:1kHz
V:1.8Vp-p
IC601 PIN24 REC
H:1kHz
V:1,8Vs-s
STIFT 24 DES IC601
AUFZEICHNUNG

AUDIO



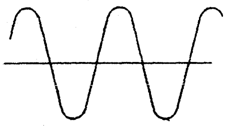
H:70kHz ± 5kHz
V:8mVp-p
TP601 (+), TP602 (−)
REC
H:70kHz ± 5kHz
V:8mVs-s
TP601 (+), TP602 (−)
AUFZEICHNUNG

AUDIO



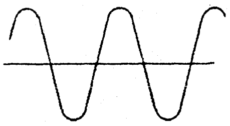
H:70kHz ± 5kHZ
V:66Vp-p
T601 PIN5 REC
H:70kHz ± 5kHz
V:66Vs-s
STIFT 5 DES T601
AUFZEICHNUNG

AUDIO



H:1kHz
V:32mVp-p
IC601 PIN9 PB
H:1kHz
V:32mVs-s
STIFT 9 DES IC601
WIEDERGABE

AUDIO



H:1kHz
V:0.96Vp-p REC
V:0.8Vp-p PB
AJ CONNECTOR PIN10
H:1kHz
V:0,96Vs-s
AUFZEICHNUNG
V:0,8Vs-s
WIEDERGABE
STIFT 10 DES
ANSCHLUß AJ

- **AUDIO** REC: −3.8dBs 1KHz INPUT SIGNAL PB: Alignment tape (VROCPSV, 1kHz Level control signal)
- **TON** AUFZEICHNUNG: −3.8dBs 1kHz Prüfpunkt
WIEDERGABE: Abgleichband (VROCPSV, Steuerpegelsignal 1kHz)

SIGNAL FLOW SYMBOLS AT A GLANCE / SIGNAL FLUSSYMBOLE AUF EINEN BLICK

MAIN CIRCUIT (1) / HAUPTSCHALTUNG (1)

D-ERR ▷	**Drum Error Voltage** **Trommel-Fehlerspannung**	C-ERR ▷	**Capstan Error Voltage** **Antriebsachsenfehlerspannung**
D-FG ▷	**Drum Frequency Comparison Signal** **Trommel-Freqenzbezugssignal**	C-FG ▷	**Capstan Frequency Comparison Signal** **Antriebsachsen-Frequenzbezugssignal**
D-PG ▷	**Drum Phase Comparison Signal** **Trommel-Phase-Vergleichssignal**	PBCTL ▷	**Playback Control Comparison Signal** **Wiedergabe-Steuer-Vergleichssignal**

MAIN CIRCUIT (2) / HAUPTSCHALTUNG (2)

PB-C ▷	**Playback Chrominance Signal** **Wiedergabe-Chrominanzsignal**	REC-C ▷	**Recording Chrominance Signal** **Aufzeichnungs-Chrominanzsignal**
PB-Y ▷	**Playback Luminance Signal** **Wiedergabe-Luminanzsignal**	REC-Y ▷	**Recording Luminance Signal** **Aufzeichnungs-Luminanzsignal**
PB ▷	**Audio Playback Signal** **Tonwiedergabesignal**	REC ▷	**Audio Recording Signal** **Tonaufzeichnungssignal**
E-E ▷	**E-E Signal (Video) (Audio)** **EE Signal (Video) (Ton)**		

MAIN CIRCUIT (3) / HAUPTSCHALTUNG (3)

PB ▷	**Audio PlaybackSignal** **Tonwiedergabesignal**	REC ▷	**Audio Recording Signal** **Tonaufzeichnungssignal**
E-E ▷	**E-E Signal (Video) (Audio)** **EE Signal (Video) (Ton)**		

IF/TUNER CIRCUIT / ZF/TUNER-SCHALTUNG

PB-C ▷	**Playback Chrominance Signal** **Wiedergabe-Chrominanzsignal**	REC-C ▷	**Recording Chrominance Signal** **Aufzeichnungs-Chrominanzsignal**
PB-Y ▷	**Playback Luminance Signal** **Wiedergabe-Luminanzsignal**	REC-Y ▷	**Recording Luminance Signal** **Aufzeichnungs-Luminanzsignal**
E-E ▷	**E-E Signal (Video)** **EE Signal (Video)**		

Y/C CIRCUIT / Y/C-SCHALTUNG

PB-C ▷	**Playback Chrominance Signal** **Wiedergabe-Chrominanzsignal**	REC-C ▷	**Recording Chrominance Signal** **Aufzeichnungs-Chrominanzsignal**
PB-Y ▷	**Playback Luminance Signal** **Wiedergabe-Luminanzsignal**	REC-Y ▷	**Recording Luminance Signal** **Aufzeichnungs-Luminanzsignal**
E-E ▷	**E-E Signal (Video)** **EE Signal (Video)**		

HEAD AMP CIRCUIT / KOPFVERSTÄRKERSCHALTUNG

PB-C ▷	**Playback Chrominance Signal** **Wiedergabe-Chrominanzsignal**	REC-C ▷	**Recording Chrominance Signal** **Aufzeichnungs-Chrominanzsignal**
PB-Y ▷	**Playback Luminance Signal** **Wiedergabe-Luminanzsignal**	REC-Y ▷	**Recording Luminance Signal** **Aufzeichnungs-Luminanzsignal**

SCHEMATIC DIAGRAM / SCHALTPLAN

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "⚠" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

WICHTIGER SICHERHEITSHINWEISE:
IM INTERSSE DER SCHERHEIT UND ZUVERLÄSSIGKEIT SOLFTEN DIE ORIGINALTEILE IMMER VERWENDET WERDEN.
DIE MIT "⚠" BEZEICHNETEN BZW. (SCHWARZ) GESCHATTETEN TEILE SIND BESONDERS WICHTING SOWHOL FÜR DIE SIECHERHEIT ALS AUCH FÜR DIE SICHERE LEISTUNG.
BEIM AUSTAUSCH BITTE IMMER DIE TEILE, WIE VON DEN NUMMERN VORGESCHRIEBEN, VERWENDEN.

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CASSIS IS OPERATING.*

SICHERHEITSHINWEISE:

1. *VOR AUSWECHSELN VON TEILEN DEN NETZKABELSTECKER AUS DER NETZSTECKDOSE ZIEHEN.*
2. *KÜHLKÖRPER VON HALBLEITERN SOLLTEN BEI BETRIEB DES CHASSIS ALS MÖGLICHE URSACHEN ELEKTRISCHER SCHALÄGE BETRACHTET WERDEN.*

NOTES:

1. *The unit of resistance "ohm" is omitted (k = 1000 ohm, M = 1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *The unit of capacitance "F" is omitted (μ = μF, ρ = μμF).*
4. *The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.*

VOLTAGE MEASUREMENT CONDITIONS:

1. *DC voltages are measured between points indicated and chassis ground by VTVM, with AC230V/50Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.*
2. *Voltages are measured with 10000μV B & W or colour signal.*

WAVEFORM MEASUREMENT CONDITIONS:
10000μV 87.5 percent modulated colour bar signal is fed into tuner.

ANMERKUNGEN:

1. *Die Wiederstandseinheit "Ohm" wird weggelassen (k = 1000 Ohm, M = 1 Megohm).*
2. *Alle Wiederstände haben 1/8 Watt, sofern nicht anders angegeben.*
3. *Die Kapazitätseinheit "F" wird weggelassen (μ = μ F, P = μμF).*
4. *Die in Klammern gesetzten Werte werden in der Wiedergabe-Betriebsart erhalten; die Werte ohne Klammern werden in der Aufnahme-Betriesart erhalten.*

SPANNUNGSMESSBEDINGUNGEN:

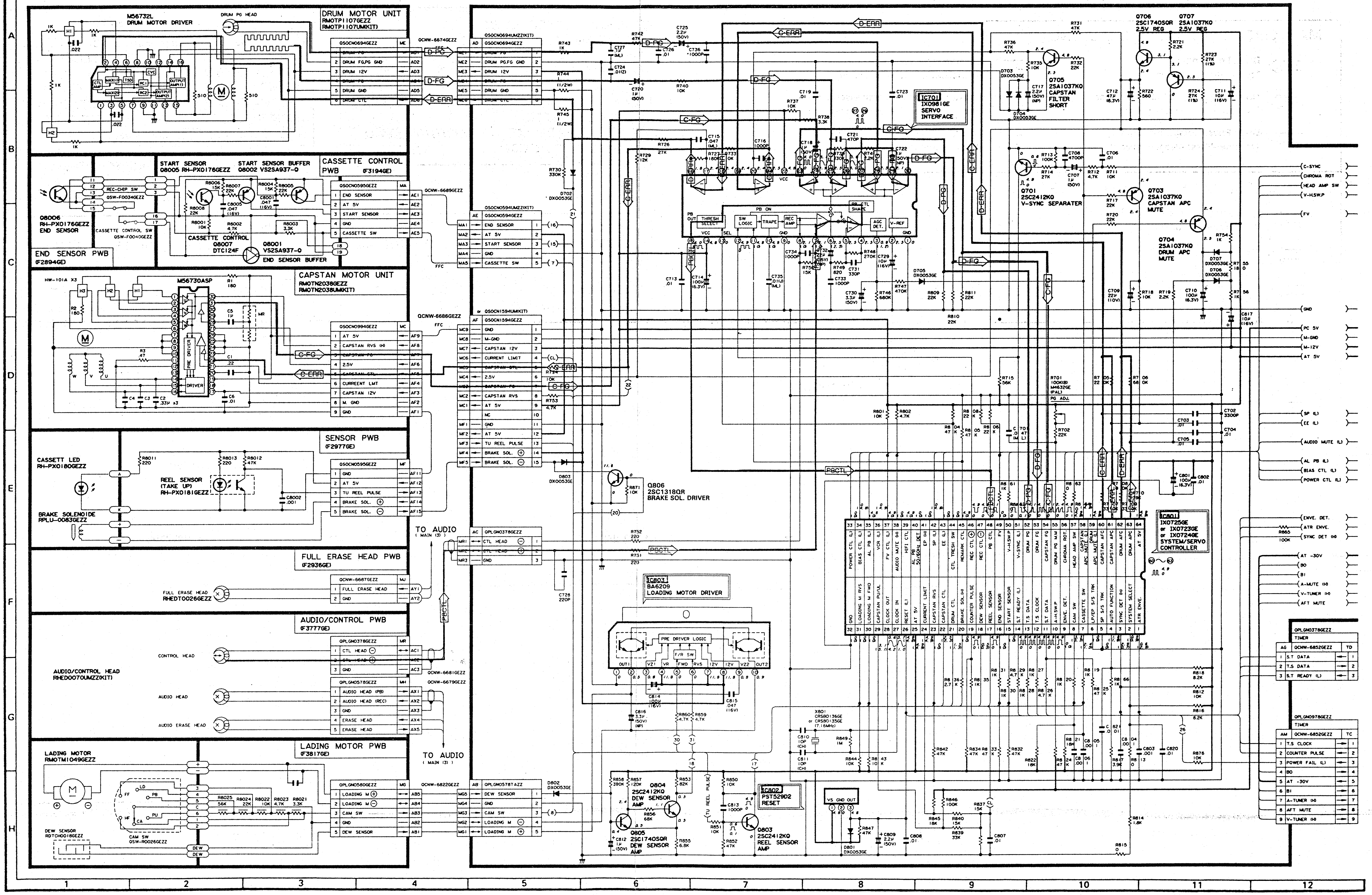
1. *Gleichspannungen werden zwischen den angegeben Punken und der Chassis mit Hilfe eines Röhrenvoltmeters gemessen, wobei dem Gerät 230 V Netzstrom (50 Hz) zugeführt wird und alle Bedienungselemente auf ein normales Bild eingestellt sind, sofern nicht anders angegeben.*
2. *Spannungen werden mit einem 10000μF V-Schwarzweißoder Farbsignal gemessen.*

WELLENFORMMESSBEDINGUNGEN:
Ein um 87,5% moduliertes 10000μ V-Farbbalkensignal wird dem Tuner zugeleitet.

CAUTION:
This circuit diagram is original one. Therefore there may be a slight difference from yours.

ANMERKUNG:
Dieses Leitungsschema ist das originale. Daher kann es von ihrem Leitungsschema etwas verschieden sein.

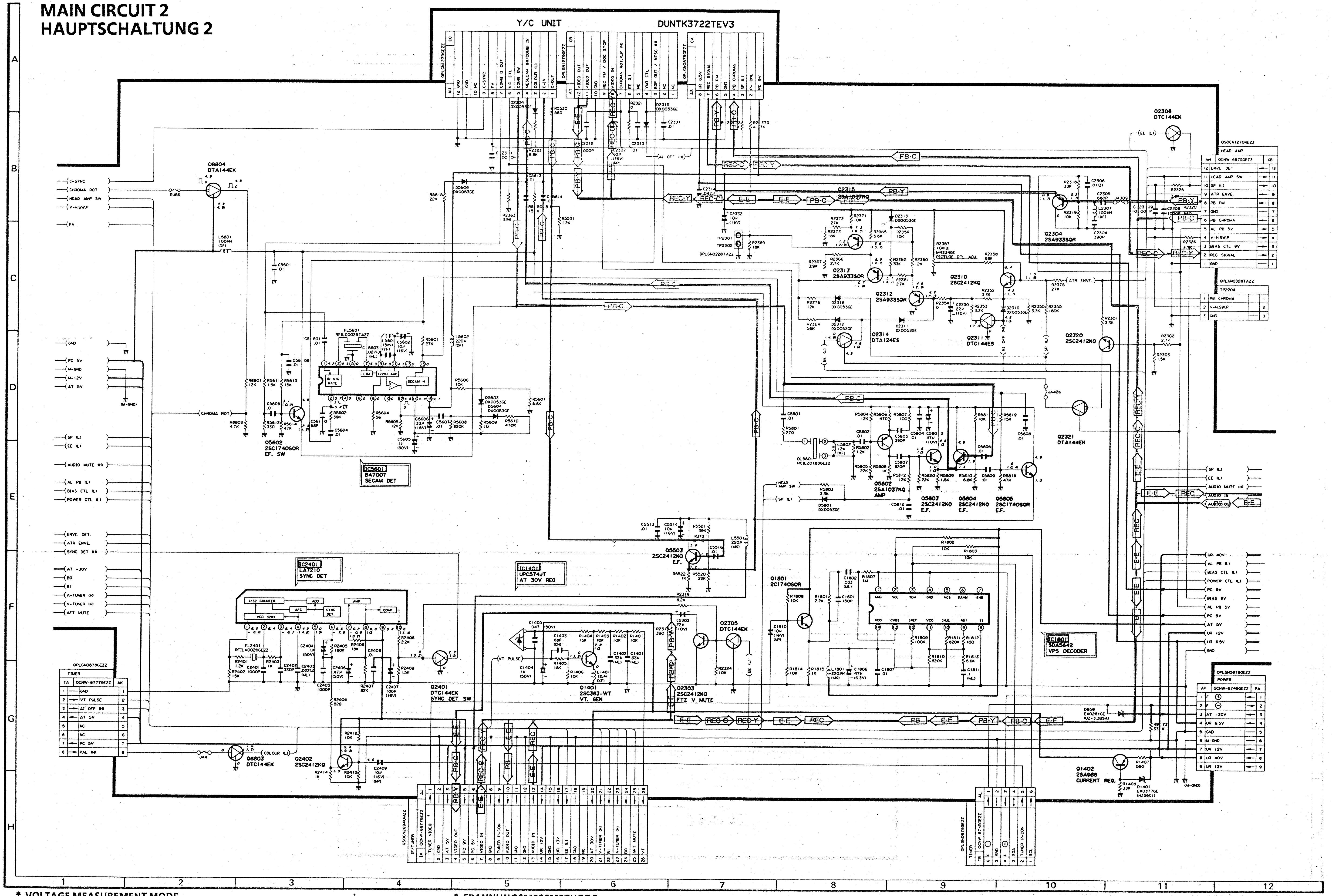
MAIN CIRCUIT 1
HAUPTSCHALTUNG 1


DRUM MOTOR UNIT
RMOTP1107GEZZ
RMOTP1107UMK(KIT)
M56732L
DRUM MOTOR DRIVER
DRUM PG HEAD
CASSETTE CONTROL PWB (F3194GE)
START SENSOR Q8005 RH-PX0176GEZZ
START SENSOR BUFFER Q8002 VS2SA937-Q
Q8006 RH-PX0176GEZZ END SENSOR
END SENSOR PWB (F2894GE)
CASSETTE CONTROL Q8007 DTC124F
Q8001 VS2SA937-Q END SENSOR BUFFER
CAPSTAN MOTOR UNIT
RMOTN2038GEZZ
RMOTN2038UMK(KIT)
M56730ASP
SENSOR PWB (F2977GE)
CASSETT LED RH-PX0180GEZZ
REEL SENSOR (TAKE UP) RH-PX0181GEZZ
BRAKE SOLENOIDE RPLU-0083GEZZ
FULL ERASE HEAD PWB (F2936GE)
FULL ERASE HEAD RHEDT0026GEZZ
AUDIO/CONTROL PWB (F3777GE)
CONTROL HEAD
AUDIO/CONTROL HEAD RHEDO070UMZZ(KIT)
AUDIO HEAD
AUDIO ERASE HEAD
LADING MOTOR PWB (F3817GE)
LADING MOTOR RMOTM1049GEZZ
DEW SENSOR RDTCH0018GEZZ
CAM SW QSW-R0026GEZZ
TO AUDIO (MAIN (3))
TO AUDIO (MAIN (3))
IC701 IX0981GE SERVO INTERFACE
Q705 2SA1037K0 CAPSTAN FILTER SHORT
Q706 2SC1740S0R 2.5V REG
Q707 2SA1037K0 2.5V REG
Q701 2SC2412K0 V-SYNC SEPARATER
Q703 2SA1037K0 CAPSTAN APC MUTE
Q704 2SA1037K0 DRUM APC MUTE
Q806 2SC1318QR BRAKE SOL. DRIVER
IC803 BA6209 LOADING MOTOR DRIVER
IC801 IX0725GE or IX0723GE or IX0724GE SYSTEM/SERVO CONTROLLER
X801 CRS801366E or CRS801356E (7.16MHz)
Q804 2SC2412K0 DEW SENSOR AMP
Q805 2SC1740S0R DEW SENSOR AMP
Q803 2SC2412K0 REEL SENSOR AMP
IC802 PST52902 RESET
D-FG
D-PG
D-ERR
C-FG
C-ERR
PBCTL
C-SYNC
CHROMA ROT
HEAD AMP SW
V-H.SW.P
FV
GND
PC 5V
M-GND
M-12V
AT 5V
SP (L)
EE (L)
AUDIO MUTE (L)
AL PB (L)
BIAS CTL (L)
POWER CTL (L)
ENVE. DET.
ATR ENVE.
SYNC DET (H)
AT -30V
BO
BI
A-MUTE (H)
V-TUNER (H)
AFT MUTE
TIMER
T.S CLOCK
COUNTER PULSE
POWER FAIL (L)
S.T DATA
T.S DATA
S.T READY (L)
1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H

* VOLTAGE MEASUREMENT MODE
PB .... Parentheses ( )
REC ...... Without Parentheses

* SPANNUNGSMESSMETHODE
WIEDERGABE .... Runde Klammern ( )
AUFNAHME .... Ohne runde Klammern

MAIN CIRCUIT 2
HAUPTSCHALTUNG 2


Y/C UNIT
DUNTK3722TEV3
IC5601
BA7007
SECAM DET
IC2401
LA7210
SYNC DET
IC1401
UPC574JT
AT 30V REG
IC1801
SDA5642
VPS DECODER
Q8804
DTA144EK
Q5602
2SC1740SOR
EF. SW
Q5503
2SC2412KQ
E.F.
Q2401
DTC144EK
SYNC DET SW
Q8803
DTC144EK
Q2402
2SC2412KQ
Q1401
2SC383-WT
VT. GEN
Q2303
2SC2412KQ
FTZ V MUTE
Q2305
DTC144EK
Q1801
2C1740SOR
Q2315
2SA1037KQ
Q2313
2SA933SOR
Q2312
2SA933SOR
Q2310
2SC2412KQ
Q2311
DTC144ES
Q2314
DTA124ES
Q2304
2SA933SOR
Q2306
DTC144EK
Q2320
2SC2412KQ
Q2321
DTA144EK
Q5802
2SA1037KQ
AMP
Q5803
2SC2412KQ
E.F.
Q5804
2SC2412KQ
E.F.
Q5805
2SC1740SOR
E.F.
Q1402
2SA966
CURRENT REG.
D959
EX0281CE
TIMER
POWER
HEAD AMP
PICTURE DTL ADJ.
C-SYNC
CHROMA ROT
HEAD AMP SW
V-H.SW.P
FV
GND
PC 5V
M-GND
M-12V
AT 5V
CHROMA ROT
SP (L)
EE (L)
AUDIO MUTE (H)
AL PB (L)
BIAS CTL (L)
POWER CTL (L)
ENVE. DET.
ATR ENVE.
SYNC DET (H)
AT -30V
B0
B1
A-TUNER (H)
V-TUNER (H)
AFT MUTE
COLOUR (L)
VT PULSE
UR 40V
UR 12V
UR 6.5V
PC 9V
BIAS 9V
AL FB 5V
AT 5V
UR 13V
PB-C
PB-Y
REC-C
REC-Y
E-E
REC
PB
A
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C
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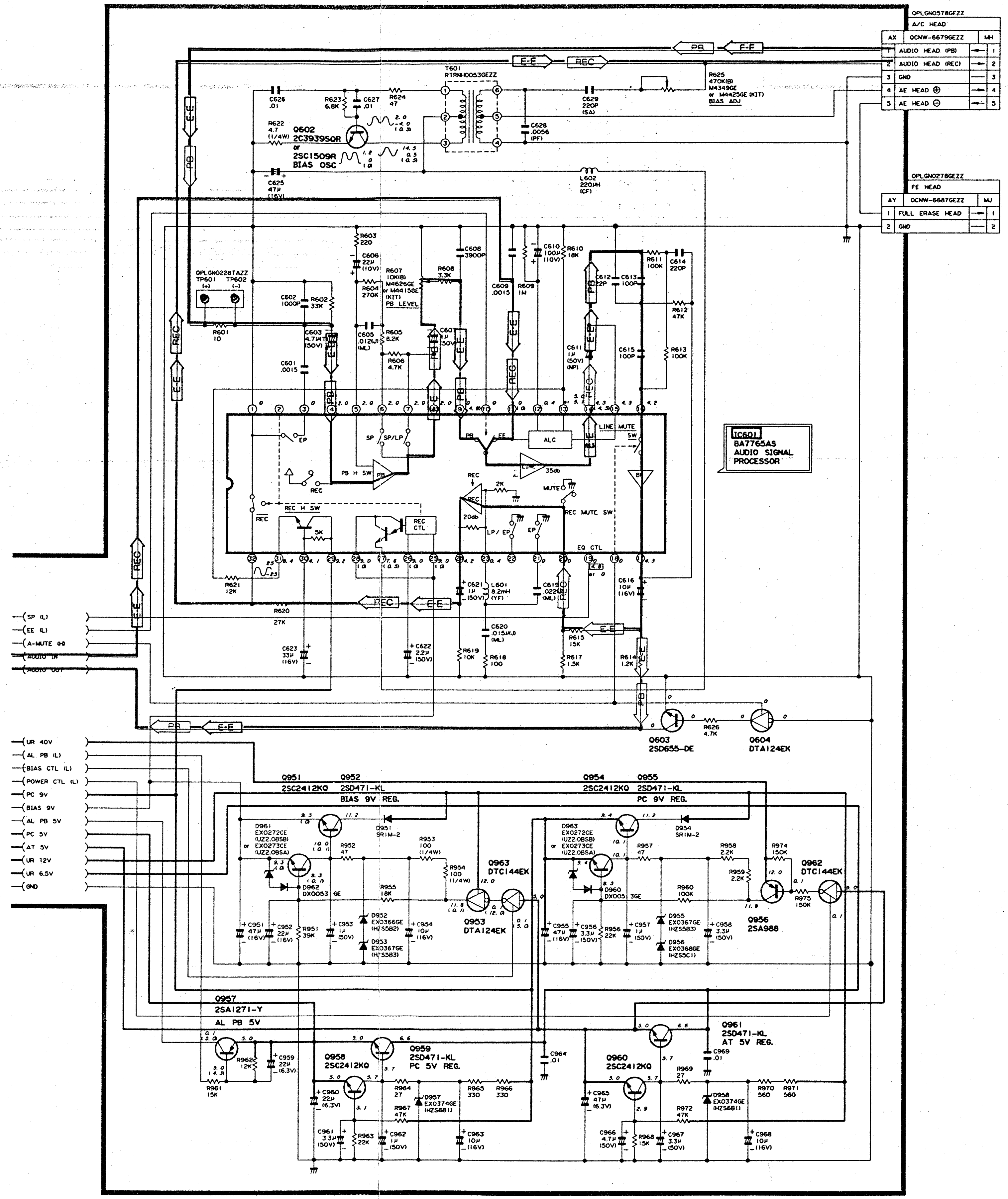
* VOLTAGE MEASUREMENT MODE
PB .... Parentheses ( )
REC ...... Without Parentheses

* SPANNUNGSMESSMETHODE
WIEDERGABE .... Runde Klammern ( )
AUFNAHME .... Ohne runde Klammern

MAIN CIRCUIT 3
HAUPTSCHALTUNG 3


QPLGN0578GEZZ
A/C HEAD
AX
QCNW-6679GEZZ
MH
1 AUDIO HEAD (PB) 1
2 AUDIO HEAD (REC) 2
3 GND 3
4 AE HEAD ⊕ 4
5 AE HEAD ⊖ 5
QPLGN0278GEZZ
FE HEAD
AY
QCNW-6687GEZZ
MJ
1 FULL ERASE HEAD 1
2 GND 2
T601 RTRNH0053GEZZ
Q602 2SC3939SQR or 2SC1509R BIAS OSC
R625 470K(B) M4349GE or M4425GE (KIT) BIAS ADJ
L602 220μH (CF)
QPLGN0228TAZZ TP601 (+) TP602 (-)
R607 10K(B) M4626GE or M4415GE (KIT) PB LEVEL
IC601 BA7765AS AUDIO SIGNAL PROCESSOR
PB H SW
REC H SW
SP/LP
ALC
LINE MUTE SW
REC MUTE SW
EQ CTL
REC CTL
MUTE
PB
REC
E-E
SP (L)
EE (L)
A-MUTE (H)
AUDIO IN
AUDIO OUT
UR 40V
AL PB (L)
BIAS CTL (L)
POWER CTL (L)
PC 9V
BIAS 9V
AL PB 5V
PC 5V
AT 5V
UR 12V
UR 6.5V
GND
Q603 2SD655-DE
Q604 DTA124EK
Q951 2SC2412KQ
Q952 2SD471-KL
BIAS 9V REG.
Q954 2SC2412KQ
Q955 2SD471-KL
PC 9V REG.
Q963 DTC144EK
Q953 DTA124EK
Q962 DTC144EK
Q956 2SA988
Q957 2SA1271-Y AL PB 5V
Q958 2SC2412KQ
Q959 2SD471-KL PC 5V REG.
Q960 2SC2412KQ
Q961 2SD471-KL AT 5V REG.
D961 EX0272CE (UZ2.0BSB) or EX0273CE (UZ2.0BSA)
D962 DX0053GE
D951 SR1M-2
D952 EX0366GE (HZS5B2)
D953 EX0367GE (HZS5B3)
D963 EX0272CE (UZ2.0BSB) or EX0273CE (UZ2.0BSA)
D960 DX0053GE
D954 SR1M-2
D955 EX0367GE (HZS5B3)
D956 EX0368GE (HZS5C1)
D957 EX0374GE (HZS6B1)
D958 EX0374GE (HZS6B1)

*** VOLTAGE MEASUREMENT MODE**

PB .... Parentheses ( )

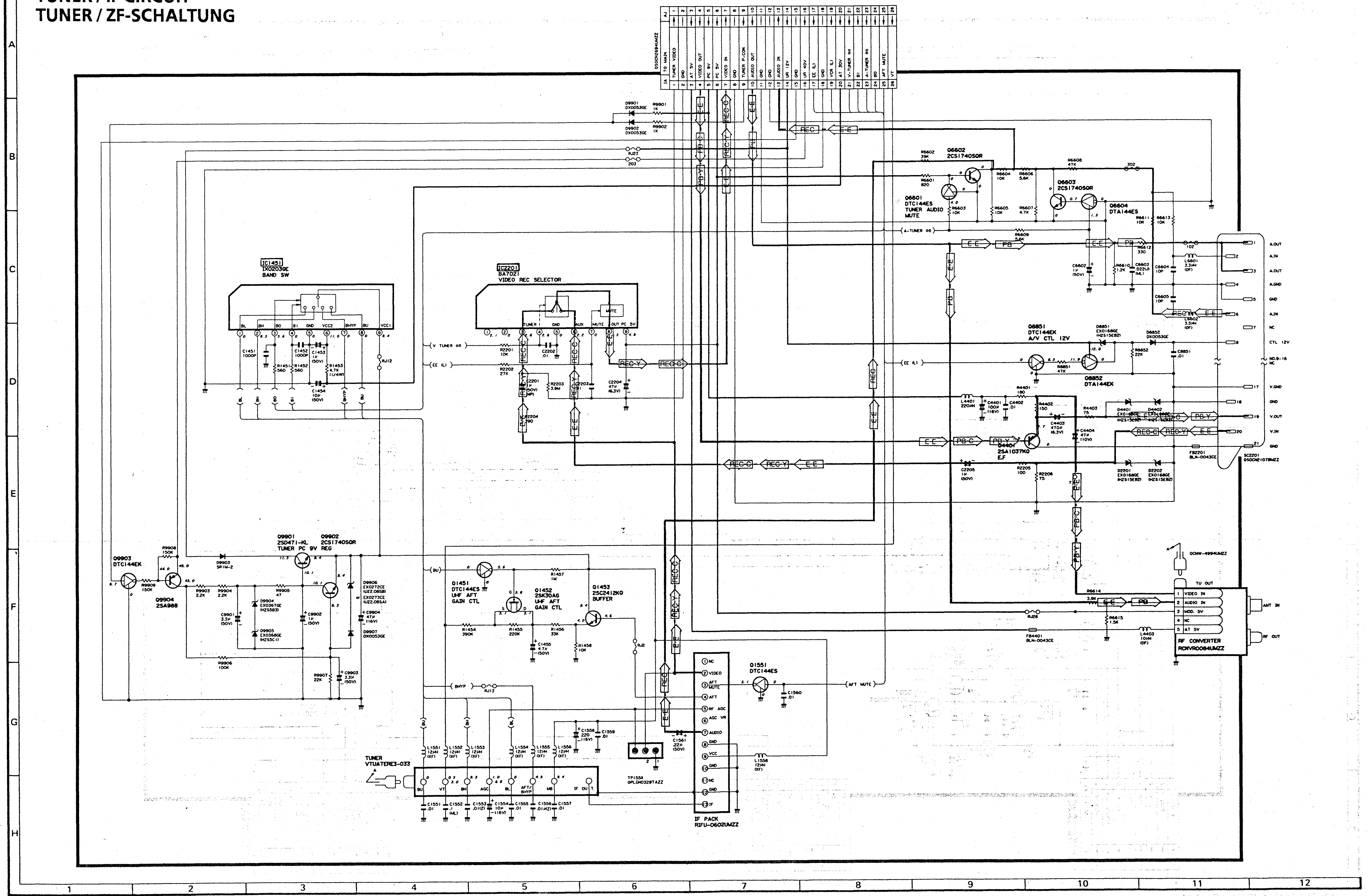
REC ...... Without Parentheses

*** SPANNUNGSMESSMETHODE**

WIEDERGABE .... Runde Klammern ( )

AUFNAHME .... Ohne runde Klammern

TUNER / IF CIRCUIT
TUNER / ZF-SCHALTUNG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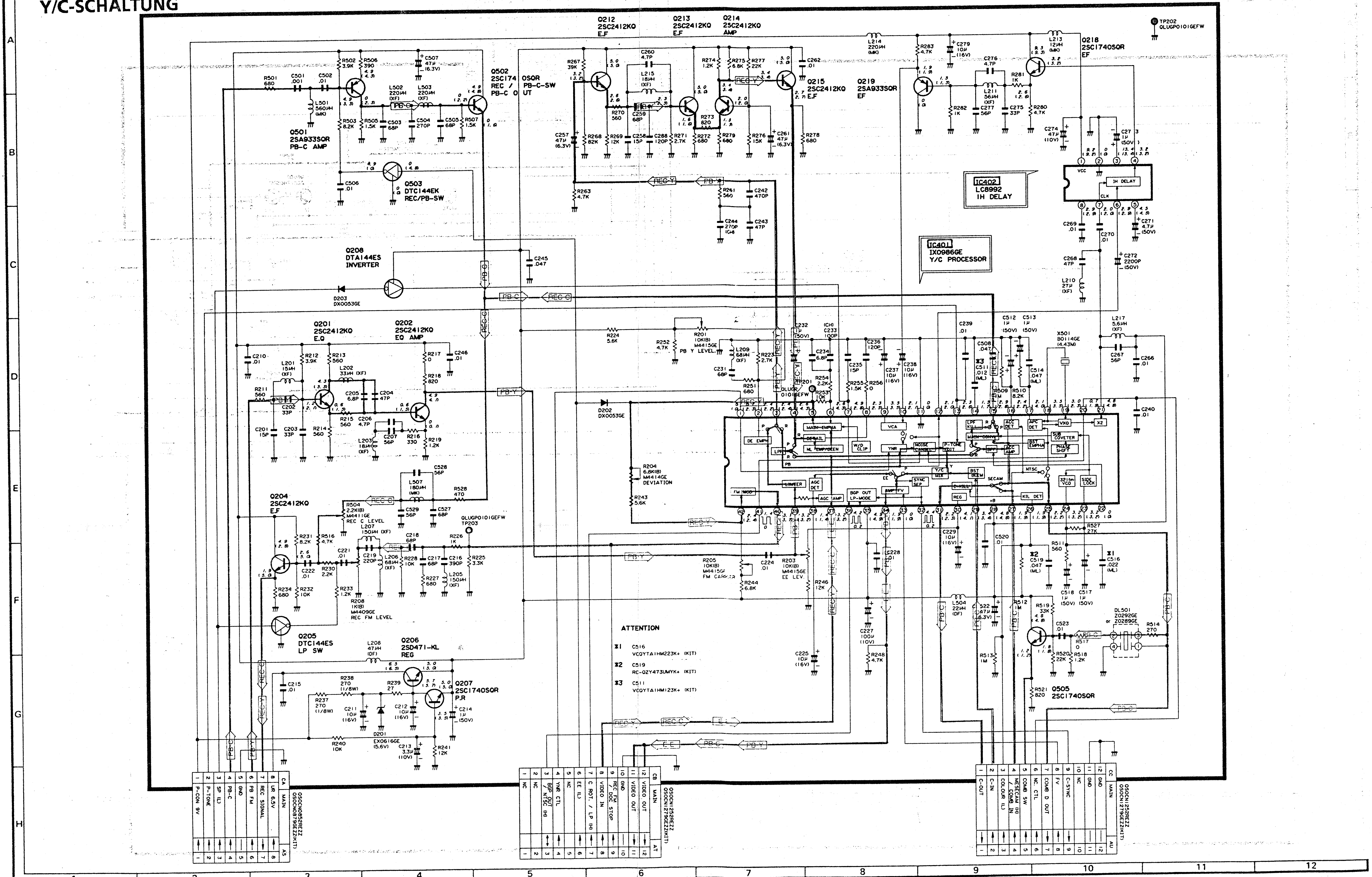
12
0SOCN2694UMZZ
TO MAIN
IA
AJ
1 TUNER VIDEO
2 GND
3 AT 5V
4 VIDEO OUT
5 PC 9V
6 PC 5V
7 VIDEO IN
8 GND
9 TUNER P-CON
10 AUDIO OUT
11 GND
12 GND
13 AUDIO IN
14 UR 12V
15 GND
16 UR 40V
17 EE (L)
18 GND
19 VCR (L)
20 AT 30V
21 V-TUNER (H)
22 BI
23 A-TUNER (H)
24 BO
25 AFT MUTE
26 VT
D9901 DX0053GE
R9901 1K
D9902 DX0053GE
R9902 1K
RJ23
203
E-E
REC-C
REC-Y
PB-C
PB-Y
PB
REC
IC1451 IX0203GE BAND SW
BL
BH
BO
BI
GND
VCC2
BHYP
BU
VCC1
C1451 1000P
C1452 1000P
C1453 1µ (50V)
R1451 560
R1452 560
R1453 4.7K (1/4W)
C1454 10µ (50V)
RJ12
IC2201 BA7021 VIDEO REC SELECTOR
TUNER
AUX
MUTE
OUT PC 5V
V TUNER (H)
EE (L)
R2201 10K
R2202 27K
C2202 .01
C2201 1µ (50V) (NP)
R2203 3.9M
C2203 .01
C2204 47µ (6.3V)
R2204 390
Q6602 2CS1740SOR
R6602 39K
R6601 820
Q6601 DTC144ES TUNER AUDIO MUTE
R6603 10K
R6604 10K
R6606 5.6K
R6605 10K
R6607 4.7K
R6608 47K
302
Q6603 2CS1740SOR
Q6604 DTA144ES
R6611 10K
R6613 10K
A-TUNER (H)
R6609 5.6K
R6612 330
102
C6602 1µ (50V)
R6610 1.2K
C6603 .022(J) (ML)
C6604 10P
L6601 3.3µH (DF)
C6605 10P
L6602 3.3µH (DF)
Q8851 DTC144EK A/V CTL 12V
D8851 EX0168GE (HZS15EB2)
D8852 DX0053GE
R8852 22K
C8851 .01
R8851 47K
Q8852 DTA144EK
L4401 220µH
C4401 100µ (16V)
C4402 .01
R4401 180
R4402 150
C4403 470µ (6.3V)
C4404 47µ (10V)
R4403 75
D4401 EX0168GE (HZS15EB2)
D4402 EX0168GE (HZS15EB2)
Q4401 2SA1037KQ E.F
C2205 1µ (50V)
R2205 100
R2206 75
D2201 EX0168GE (HZS15EB2)
D2202 EX0168GE (HZS15EB2)
FB2201 BLN-0043CE
SC2201 0SOCN2107BMZZ
1 A.OUT
2 A.IN
3 A.OUT
4 A.GND
5 GND
6 A.IN
7 NC
8 CTL 12V
NO.9-16 NC
17 V.GND
18 GND
19 V.OUT
20 V.IN
21 GND
Q9903 DTC144EK
R9908 150K
R9909 150K
Q9904 2SA988
D9903 SR1M-2
Q9901 2SD471-KL TUNER PC 9V REG
Q9902 2CS1740SOR
R9903 2.2K
R9904 2.2K
R9905 47
D9904 EX0367GE (HZS5B3)
D9905 EX0368GE (HZS5C1)
C9901 3.3µ (50V)
C9902 1µ (50V)
D9906 EX0272CE (UZ2.085B) or EX0273CE (UZ2.085A)
C9904 47µ (16V)
D9907 DX0053GE
R9906 100K
R9907 22K
C9903 3.3µ (50V)
(BU)
Q1451 DTC144ES UHF AFT GAIN CTL
Q1452 2SK30AG UHF AFT GAIN CTL
R1457 1M
Q1453 2SC2412KQ BUFFER
R1454 390K
R1455 220K
R1456 33K
C1455 4.7µ (50V)
R1458 10K
RJ2
(BHYP)
RJ13
(BH)
(BL)
L1551 12µH (XF)
L1552 12µH (XF)
L1553 12µH (XF)
L1554 12µH (XF)
L1555 12µH (XF)
L1556 12µH (XF)
C1558 220 (16V)
C1559 .01
TUNER VTUATERE3-033
BU
VT
BH
AGC
BL
AFT/BHYP
MB
IF OUT
C1551 .01
C1552 .1 (ML)
C1553 .01(Z)
C1554 10µ (16V)
C1555 .01
C1556 .01µ(Z)
C1557 .01
TP1551 OPLGN0328TAZZ
IF PACK RIFU-0602UMZZ
① NC
② VIDEO
③ AFT MUTE
④ AFT
⑤ RF AGC
⑥ AGC VR
⑦ AUDIO
⑧ GND
⑨ VCC
⑩ GND
⑪ NC
⑫ GND
⑬ IF
C1561 .22µ (50V)
Q1551 DTC144ES
C1560 .01
(AFT MUTE)
L1558 12µH (XF)
0CNW-4994UMZZ
TU OUT
1 VIDEO IN
2 AUDIO IN
3 MOD. 5V
4 NC
5 AT 5V
ANT IN
RF OUT
RF CONVERTER RCNVR0084UMZZ
R6614 3.9K
R6615 1.5K
RJ28
FB4401 BLN-0043CE
L4403 10µH (DF)

*** VOLTAGE MEASUREMENT MODE**
PB .... Parentheses ( )
REC ...... Without Parentheses

*** SPANNUNGSMESSMETHODE**
WIEDERGABE .... Runde Klammern ( )
AUFNAHME .... Ohne runde Klammern

Y/C CIRCUIT
Y/C-SCHALTUNG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Q212 2SC2412KQ E.F
Q213 2SC2412KQ E.F
Q214 2SC2412KO AMP
Q215 2SC2412KQ E.F
Q218 2SC1740SQR EF
Q219 2SA933SQR EF
Q501 2SA933SQR PB-C AMP
Q502 2SC1740SQR REC / PB-C-SW PB-C OUT
Q503 DTC144EK REC/PB-SW
Q208 DTA144ES INVERTER
Q201 2SC2412KQ E.Q
Q202 2SC2412KQ EQ AMP
Q204 2SC2412KQ E.F
Q205 DTC144ES LP SW
Q206 2SD471-KL REG
Q207 2SC1740SQR P.R
Q505 2SC1740SQR
IC402 LC8992 1H DELAY
IC401 IX0986GE Y/C PROCESSOR
TP202 QLUGP0101GEFW
TP203 QLUGP0101GEFW
D202 DX0053GE
D203 DX0053GE
D201 EX0616GE (5.6V)
X501 8011 4GE (4.43M)
DL501 Z0292GE or Z0289GE
R201 10K(B) M4415GE PB Y LEVEL
R203 10K(B) M4415GE EE LEV.
R204 6.8K(B) M4414GE DEVIATION
R205 10K(B) M4415GE FM CARRIER
R208 1K(B) M4409GE REC FM LEVEL
R504 2.2K(B) M4411GE REC C LEVEL
REC-Y
REC-C
PB-Y
PB-C
E-E
MAIN EMPHA
DE EMPH
DETAIL
NL EMP/DEEM
W/D CLIP
VCA
YNR
NOISE CANCEL
P-TONE
LPF
BPF
ACC AMP
ACC DET
APC DET
VXO
X2
SUB CONVERTER
PHASE SHIFT
BST EMPHA
MAIN CONV
Y/C MIX
SYNC SEP
LIMITER
AGC DET
AGC AMP
BGP OUT LP-MODE
FM MOD
REG
KIL DET
SECAM
NTSC
321fH VCO
SIDE LOCK
C-KILL
BST BLKM
1H DELAY
VCC
CLK
ATTENTION
*1 C516 VCQYTA1HM223K+ (KIT)
*2 C519 RC-QZY473UMYK+ (KIT)
*3 C511 VCQYTA1HM123K+ (KIT)
1 P-CON 9V
2 P-TONE
3 SP (L)
4 PB-C
5 GND
6 PB FM
7 REC SIGNAL
8 LR 6.5V
CA MAIN
QSOCN0852REZZ
QSOCN0879GEZZ(KIT)
AS
1 NC
2 NC
3 BGP OUT / NTSC (H)
4 YNR CTL
5 EE (L)
6 NC
7 C ROT. / LP (H)
8 GND
9 VIDEO IN
10 REC FM DOC STOP
11 VIDEO OUT
12 VIDEO OUT
CB MAIN
QSOCN1252REZZ
QSOCN1279GEZZ(KIT)
AT
1 C-OUT
2 C-IN
3 COLOUR (L)
4 MESECAM (H) / COMB IN
5 COMB SW
6 NC. CTL
7 COMB D OUT
8 FV
9 C-SYNC
10 NC
11 GND
12 NC
CC MAIN
QSOCN1252REZZ
QSOCN1279GEZZ(KIT)
AU

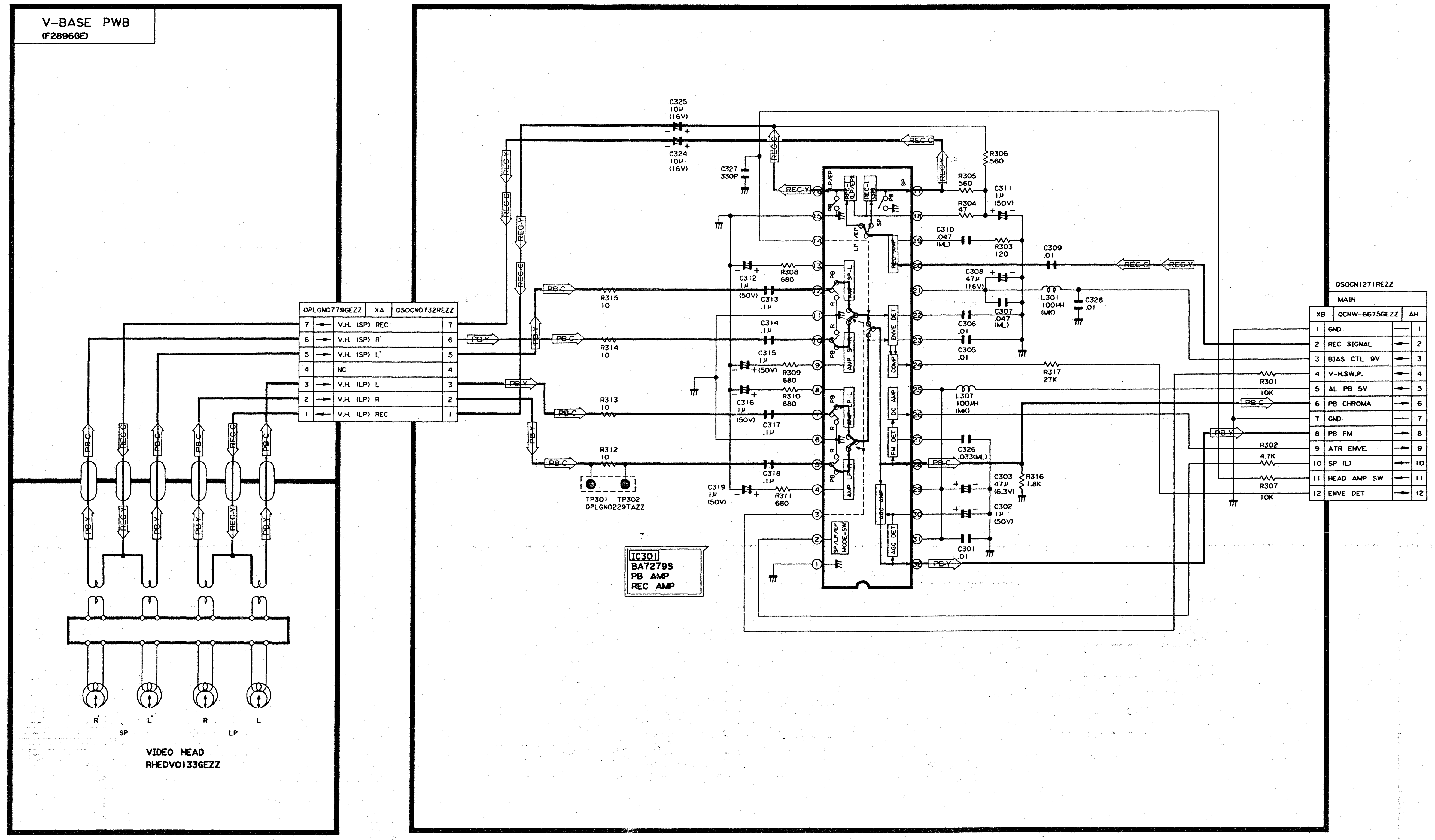
- **VOLTAGE MEASUREMENT MODE**

PB .... **Parentheses ( )**
REC ...... **Without Parentheses**

- **SPANNUNGSMESSMETHODE**

WIEDERGABE .... **Runde Klammern ( )**
AUFNAHME .... **Ohne runde Klammern**

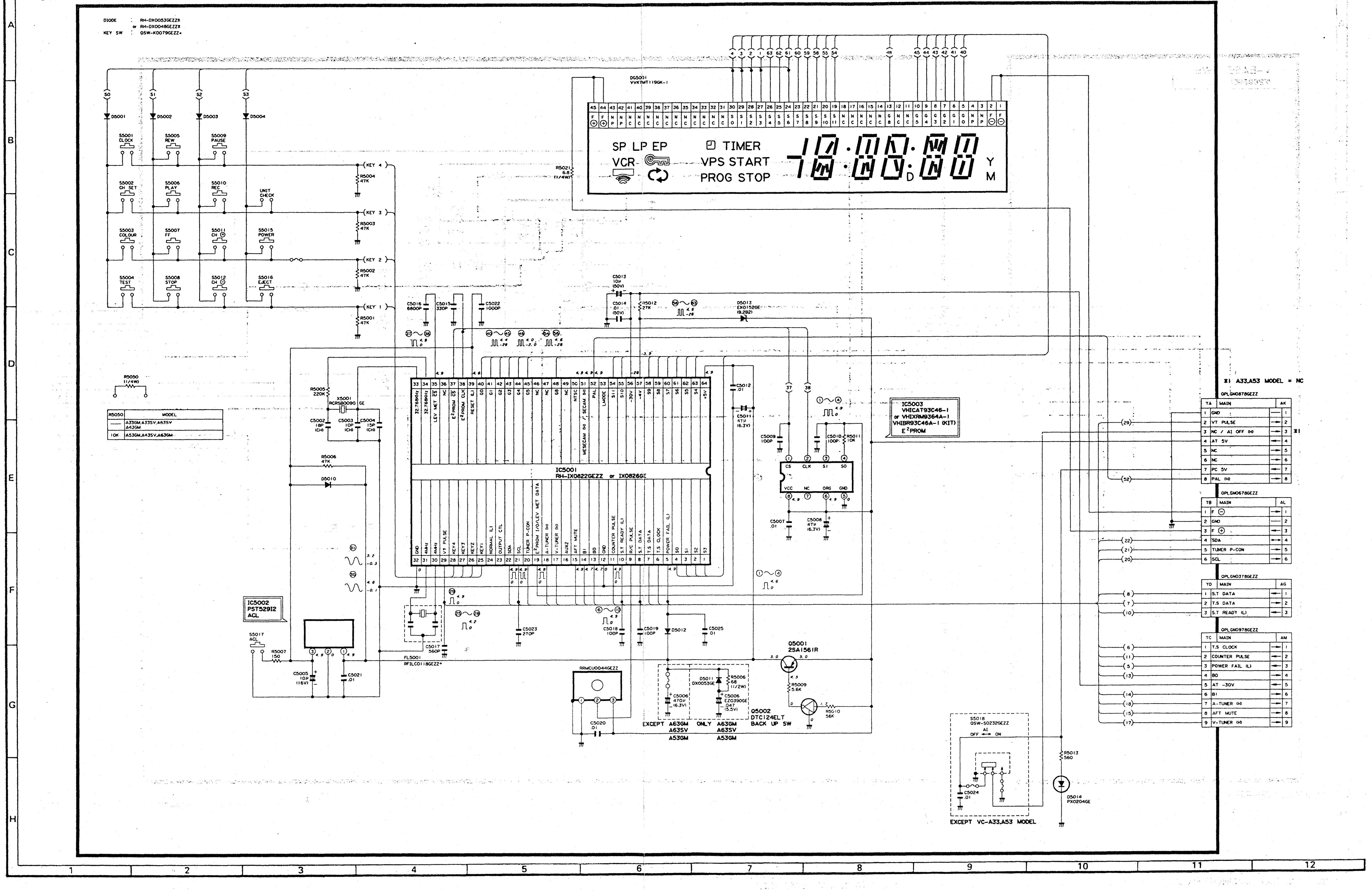
HEAD AMP. CIRCUIT
KOPFVERSTÄRKERSCHALTUNG


V-BASE PWB
(F2896GE)
OPLGN0779GEZZ
XA
0SOCN0732REZZ
7 V.H. (SP) REC 7
6 V.H. (SP) R' 6
5 V.H. (SP) L' 5
4 NC 4
3 V.H. (LP) L 3
2 V.H. (LP) R 2
1 V.H. (LP) REC 1
PB-C
REC-C
PB-Y
REC-Y
R'
L'
R
L
SP
LP
VIDEO HEAD
RHEDV0133GEZZ
C325 10µ (16V)
C324 10µ (16V)
C327 330P
R306 560
R305 560
R304 47
C311 1µ (50V)
C310 .047 (ML)
R303 120
C309 .01
C308 47µ (16V)
C307 .047 (ML)
L301 100µH (MK)
C328 .01
C306 .01
C305 .01
R317 27K
L307 100µH (MK)
C326 .033(ML)
C303 47µ (6.3V)
R316 1.8K
C302 1µ (50V)
C301 .01
C312 1µ (50V)
R308 680
C313 .1µ
C314 .1µ
C315 1µ (50V)
R309 680
C316 1µ (50V)
R310 680
C317 .1µ
C318 .1µ
C319 1µ (50V)
R311 680
R315 10
R314 10
R313 10
R312 10
TP301 TP302
OPLGN0229TAZZ
LP/EP
REC-I (LP/EP)
REC-I (SP)
SP
PB
REC AMP
SP-L
AMP
LP-L
ENVE DET
COMP
DC AMP
FM DET
AGC AMP
AGC DET
SP/LP/EP MODE-SW
IC301
BA7279S
PB AMP
REC AMP
R301 10K
R302 4.7K
R307 10K
0SOCN1271REZZ
MAIN
XB
0CNW-6675GEZZ
AH
1 GND 1
2 REC SIGNAL 2
3 BIAS CTL 9V 3
4 V-H.SW.P. 4
5 AL PB 5V 5
6 PB CHROMA 6
7 GND 7
8 PB FM 8
9 ATR ENVE. 9
10 SP (L) 10
11 HEAD AMP SW 11
12 ENVE DET 12
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

*** VOLTAGE MEASUREMENT MODE**
PB .... Parentheses ( )
REC ...... Without Parentheses

*** SPANNUNGSMESSMETHODE**
WIEDERGABE .... Runde Klammern ( )
AUFNAHME .... Ohne runde Klammern

TIMER CIRCUIT
TIMER-SCHALTUNG


DIODE : RH-DX0053GEZZ*
or RH-DX0048GEZZ*
KEY SW : QSW-K0079GEZZ+
S0
S1
S2
S3
D5001
D5002
D5003
D5004
S5001 CLOCK
S5005 REW
S5009 PAUSE
S5002 CH SET
S5006 PLAY
S5010 REC
UNIT CHECK
S5003 COLOUR
S5007 FF
S5011 CH ⊕
S5015 POWER
S5004 TEST
S5008 STOP
S5012 CH ⊖
S5016 EJECT
KEY 4
KEY 3
KEY 2
KEY 1
R5004 47K
R5003 47K
R5002 47K
R5001 47K
DG5001 VVKTMT119GK-1
R5021 6.8 (1/4W)
SP LP EP
TIMER
VCR
VPS START
PROG STOP
Y
D
M
C5016 6800P
C5015 330P
C5022 1000P
C5013 10μ (50V)
C5014 .01 (50V)
R5012 27K
D5013 EX0152GE
R5050 (1/4W)
R5005 220K
X5001 RCRSB0090GE
C5002 18P (CH)
C5003 10P (CH)
C5004 15P (CH)
R5006 47K
D5010
IC5001 RH-IX0822GEZZ or IX0826GE
32.768KHz
LEV MET CS
NC
E²PROM CS
E²PROM CLK
RESET (L)
G0
G1
G2
G3
G4
G5
G8
NTSC
MESECAM (H) / SECAM (H)
PAL
LMODE
S11
S10
-30V
-4V
S9
S8
S7
S6
S5
S4
+5V
GND
4MHz
VT PULSE
KEY4
KEY3
KEY2
KEY1
NORMAL (L)
OUTPUT CTL
SDA
SCL
TUNER P-CON
E²PROM I/O/LEV MET DATA
A-TUNER (H)
V-TUNER (H)
AUX2
AFT MUTE
B1
B0
COUNTER PULSE
S.T READY (L)
R/C PULSE
S.T DATA
T.S DATA
T.S CLOCK
POWER FAIL (L)
C5012 .01
C5011 47μ (6.3V)
C5009 100P
C5010 100P
R5011 10K
C5007 .01
C5008 47μ (6.3V)
CS CLK SI SO VCC NC ORG GND
IC5003
VHICAT93C46-1
or VHIXRM9364A-1
VHIBR93C46A-1 (KIT)
E²PROM
IC5002 PST529I2 ACL
S5017 ACL
R5007 150
C5005 10μ (16V)
C5021 .01
FL5001 RFILC0118GEZZ+
C5017 560P
C5023 270P
C5018 100P
C5019 100P
D5012
C5025 .01
RRMCU0044GEZZ
C5020 .01
C5006 470μ (6.3V)
D5011 DX0053GE
R5006 68 (1/2W)
C5006 EZ0390GE .047 (5.5V)
EXCEPT A63GM A63SV A53GM
ONLY A63GM A63SV A53GM
Q5001 2SA1561R
R5009 5.6K
Q5002 DTC124ELT BACK UP SW
R5010 56K
S5018 QSW-S0232GEZZ
A1 OFF ↔ ON
C5024 .01
EXCEPT VC-A33,A53 MODEL
R5013 560
D5014 PX0204GE
※1 A33,A53 MODEL = NC
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

R5050	MODEL
——	A33GM,A33SV,A63SV A43GM
10K	A53GM,A43SV,A63GM

QPLGN0878GEZZ

TA	MAIN		AK
1	GND	—	1
2	VT PULSE	→	2
3	NC / A1 OFF (H)	→	3 ※1
4	AT 5V	←	4
5	NC	→	5
6	NC	→	6
7	PC 5V	←	7
8	PAL (H)	→	8

QPLGN0678GEZZ

TB	MAIN		AL
1	F ⊖	→	1
2	GND	—	2
3	F ⊕	←	3
4	SDA	↔	4
5	TUNER P-CON	→	5
6	SCL	→	6

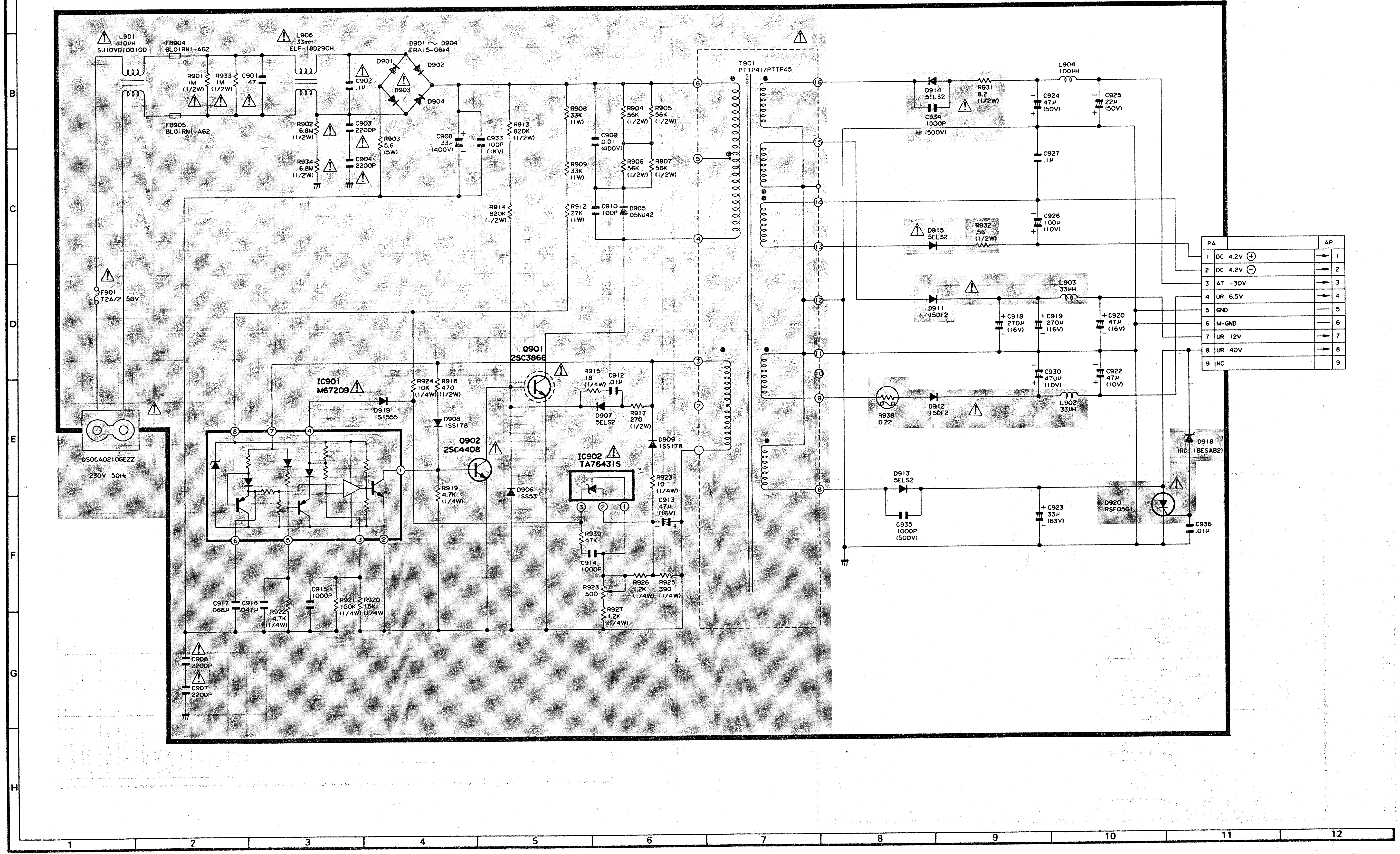
QPLGN0378GEZZ

TD	MAIN		AG
1	S.T DATA	←	1
2	T.S DATA	→	2
3	S.T READY (L)	←	3

QPLGN0978GEZZ

TC	MAIN		AM
1	T.S CLOCK	→	1
2	COUNTER PULSE	←	2
3	POWER FAIL (L)	←	3
4	B0	→	4
5	AT -30V	←	5
6	B1	→	6
7	A-TUNER (H)	→	7
8	AFT MUTE	→	8
9	V-TUNER (H)	→	9

POWER CIRCUIT
HAUPTSTROMKREISSCHALTUNG


L901 10mH SU10VD10010D
FB904 BL01RN1-A62
FB905 BL01RN1-A62
R901 1M (1/2W)
R933 1M (1/2W)
C901 .47
L906 33mH ELF-18D290H
D901 ~ D904 ERA15-06x4
D901
D902
D903
D904
C902 .1μ
R902 6.8M (1/2W)
R934 6.8M (1/2W)
C903 2200P
C904 2200P
R903 5.6 (5W)
C908 33μ (400V)
C933 100P (1KV)
R913 820K (1/2W)
R914 820K (1/2W)
R908 33K (1W)
R909 33K (1W)
R912 27K (1W)
C909 0.01 (400V)
R904 56K (1/2W)
R905 56K (1/2W)
R906 56K (1/2W)
R907 56K (1/2W)
C910 100P
D905 05NU42
T901 PTTP41/PTTP45
F901 T2A/2 50V
0S0CA0210GEZZ
230V 50Hz
IC901 M67209
D919 1S1555
R924 10K (1/4W)
R916 470 (1/2W)
D908 1SS178
Q901 2SC3866
Q902 2SC4408
R919 4.7K (1/4W)
D906 1SS53
R915 18 (1/4W)
C912 .01μ
D907 5ELS2
R917 270 (1/2W)
D909 1SS178
IC902 TA76431S
R923 10 (1/4W)
C913 47μ (16V)
R939 47K
C914 1000P
R928 500
R926 1.2K (1/4W)
R925 390 (1/4W)
R927 1.2K (1/4W)
C917 .068μ
C916 .047μ
R922 4.7K (1/4W)
C915 1000P
R921 150K (1/4W)
R920 15K (1/4W)
C906 2200P
C907 2200P
D914 5ELS2
C934 1000P (500V)
R931 8.2 (1/2W)
L904 100μH
C924 47μ (50V)
C925 22μ (50V)
C927 .1μ
C926 100μ (10V)
D915 5ELS2
R932 .56 (1/2W)
D911 15DF2
L903 33μH
C918 270μ (16V)
C919 270μ (16V)
C920 47μ (16V)
C930 470μ (10V)
C922 47μ (10V)
R938 0.22
D912 15DF2
L902 33μH
D913 5ELS2
C935 1000P (500V)
C923 33μ (63V)
D920 RSF05G1
D918 (RD 18ESAB2)
C936 .01μ
PA
AP
1 DC 4.2V (+) 1
2 DC 4.2V (−) 2
3 AT −30V 3
4 UR 6.5V 4
5 GND 5
6 M-GND 6
7 UR 12V 7
8 UR 40V 8
9 NC 9
A
B
C
D
E
F
G
H
1
2
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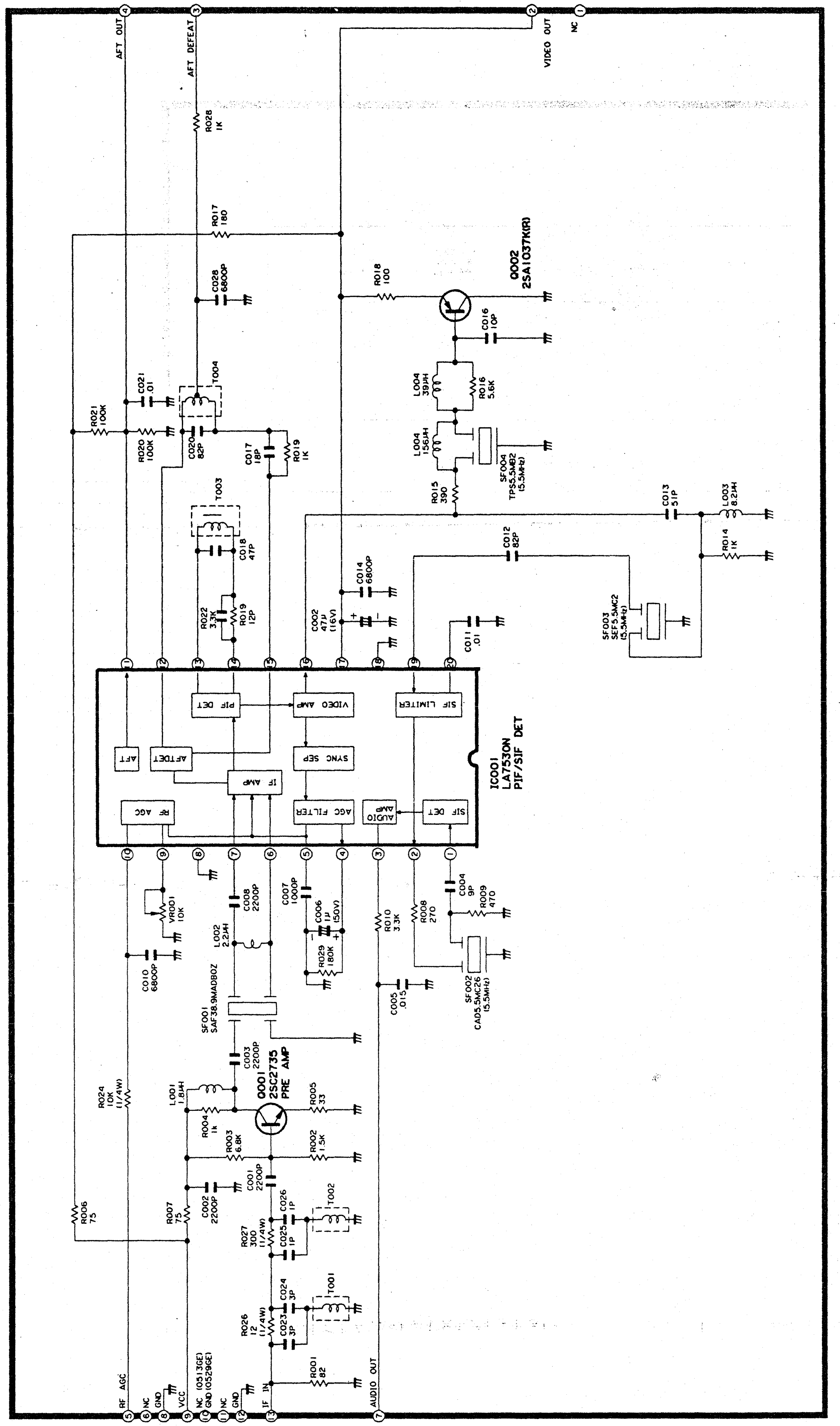
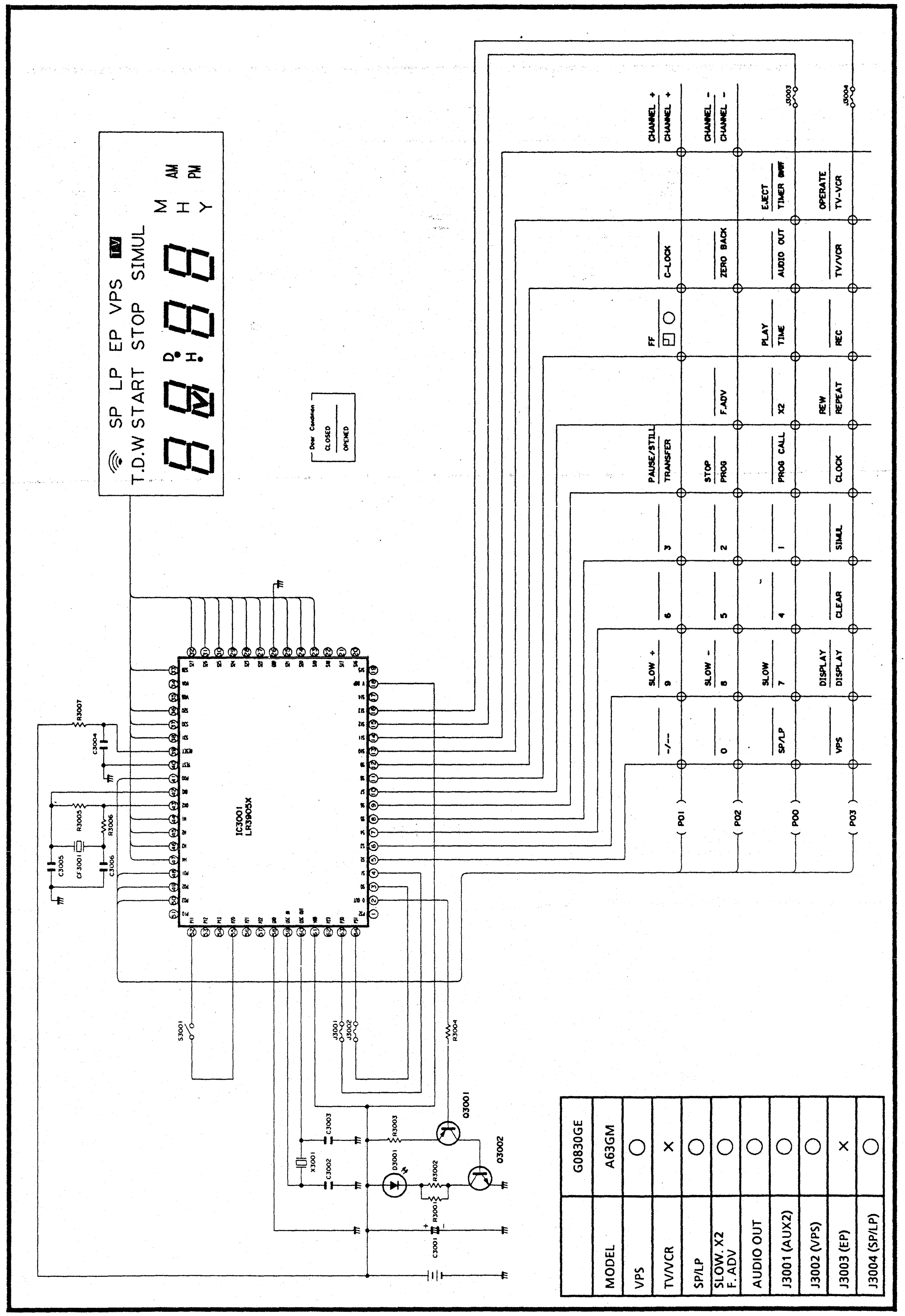
11
12

IF PACK
ZF-BAUGRUPPE

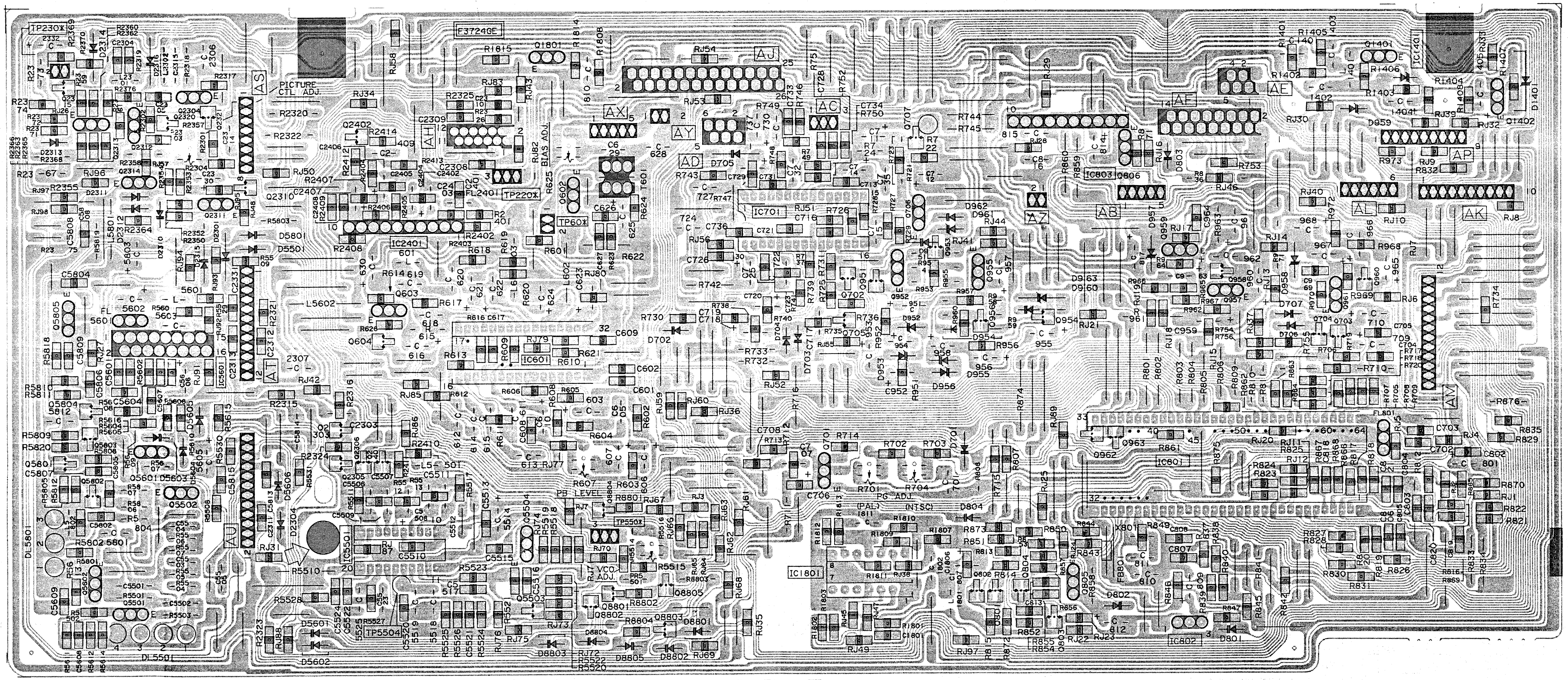

AFT OUT
AFT DEFEAT
VIDEO OUT
NC
R028 1K
R017 180
C026 6800P
R018 100
Q002 2SA1037K(R)
C016 10P
L004 39μH
R016 5.6K
L004 15μH
SF004 TPS5.5MB2 (5.5MHz)
R015 390
C021 .01
T004
R021 100K
R020 100K
C020 82P
C017 18P
R019 1K
T003
C018 47P
C013 51P
L003 8.2μH
R014 1K
C012 82P
C014 6800P
SF003 SFE5.5MC2 (5.5MHz)
R022 3.3K
R019 12P
C002 47μ (16V)
C011 .01
AFT
AFTDET
PIF DET
VIDEO AMP
SIF LIMITER
SYNC SEP
IF AMP
RF AGC
AGC FILTER
AUDIO AMP
SIF DET
IC001 LA7530N PIF/SIF DET
VR001 10K
C008 2200P
C007 1000P
C006 1μ (50V)
R010 3.3K
R008 270
C004 9P
R009 470
L002 2.2μH
R029 180K
C010 6800P
C005 .015
SF002 CADS.5MC26 (5.5MHz)
SF001 SAF38.9MA0Z
C003 2200P
Q001 2SC2735 PRE AMP
R024 10K (1/4W)
L001 1.8μH
R005 33
R004 1K
R003 6.8K
R002 1.5K
C001 2200P
C026 1P
T002
R006 75
R007 75
C002 2200P
R027 300 (1/4W)
C025 1P
R026 12 (1/4W)
C024 3P
C023 3P
T001
R001 82
RF AGC
NC
GND
VCC
NC
GND
IF IN
AUDIO OUT

INFRARED REMOTE CONTROL CIRCUIT
INFRAROTFERNBEDIENUNGSSCHALTUNG

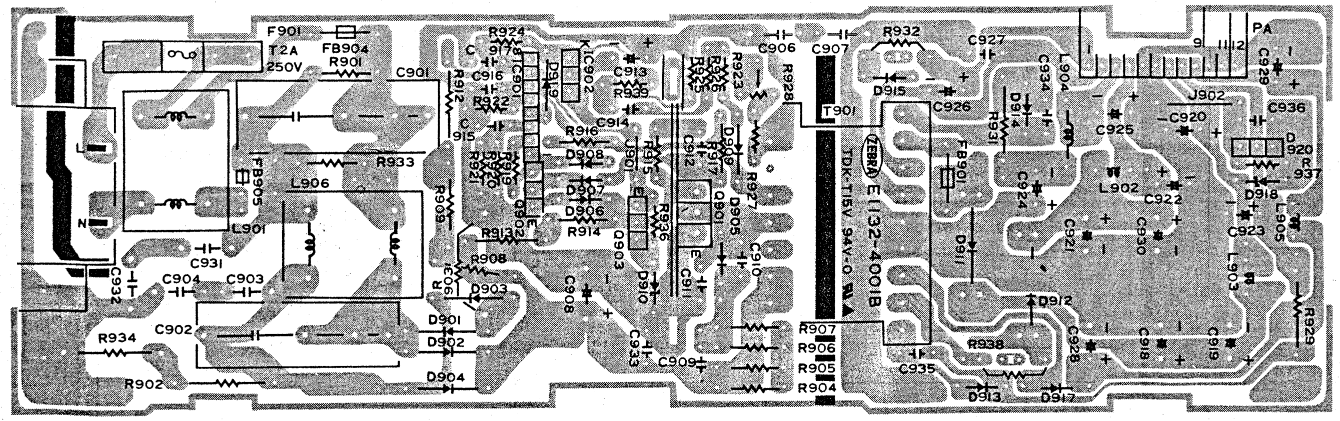

SP LP EP VPS
T.D.W START STOP SIMUL
M H Y
AM PM
D. H.
Door Condition
CLOSED
OPENED
IC3001 LR3905X
R3007
C3004
R3005
R3006
C3005
CF3001
C3006
S3001
J3001
J3002
R3004
Q3001
Q3002
D3001
R3002
R3003
C3003
X3001
C3002
R3001
C3001
CHANNEL + / CHANNEL +
CHANNEL - / CHANNEL -
J3003
J3004
EJECT / TIMER BWF
OPERATE / TV-VCR
C-LOCK
ZERO BACK
AUDIO OUT
TV/VCR
FF
PLAY / TIME
REC
F.ADV
X2
REW / REPEAT
PAUSE/STILL / TRANSFER
STOP / PROG
PROG CALL
CLOCK
3
2
1
SIMUL
6
5
4
CLEAR
SLOW + / 9
SLOW - / 8
SLOW / 7
DISPLAY / DISPLAY
-/--
0
SP/LP
VPS
P01
P02
P00
P03

	G0830GE
MODEL	A63GM
VPS	○
TV/VCR	×
SP/LP	○
SLOW. X2 F. ADV	○
AUDIO OUT	○
J3001 (AUX2)	○
J3002 (VPS)	○
J3003 (EP)	×
J3004 (SP/LP)	○

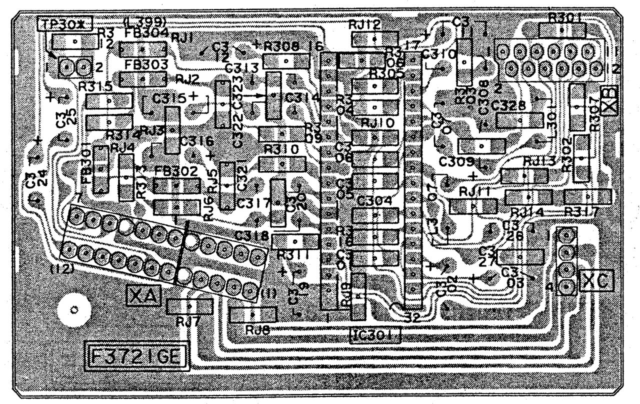
PRINTED WIRING BOARD ASSEMBLIES
LEITERPLATTENEINHEITEN



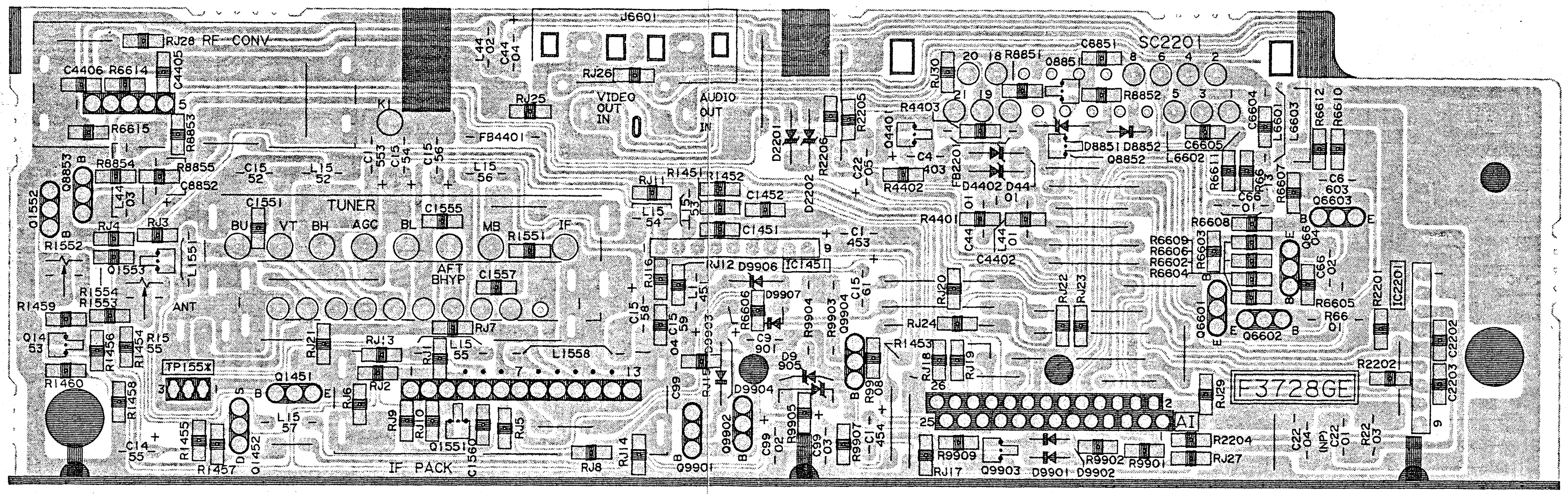
MAIN PWB / HAUPT-LEITERPLATTE



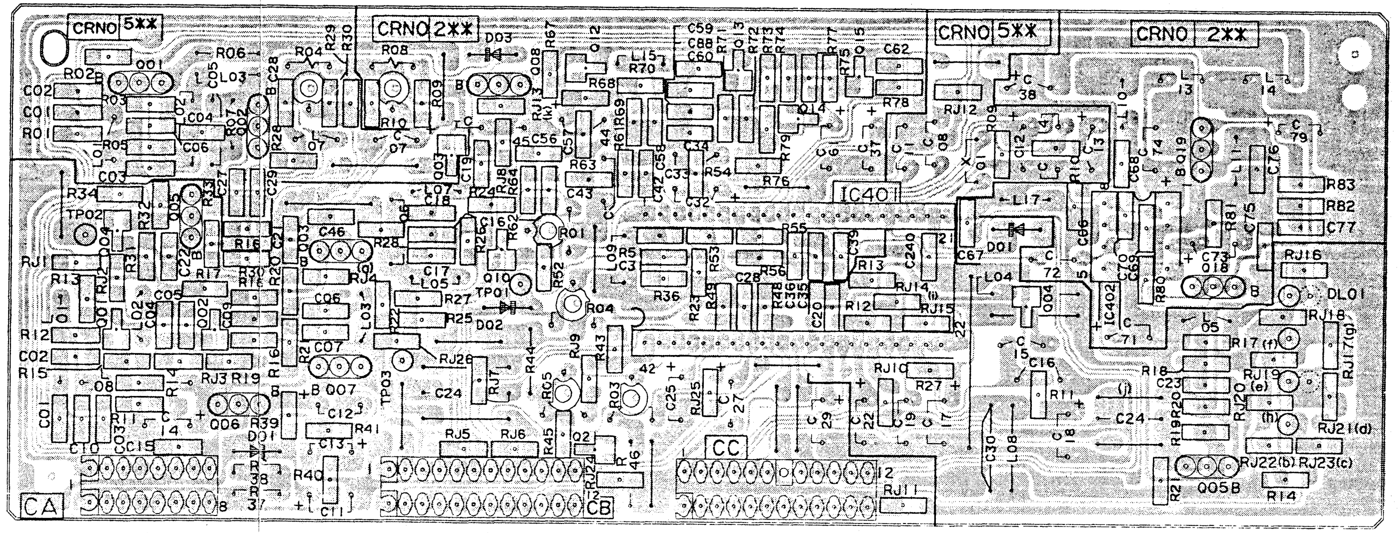
POWER PWB / STROM-LEITERPLATTE



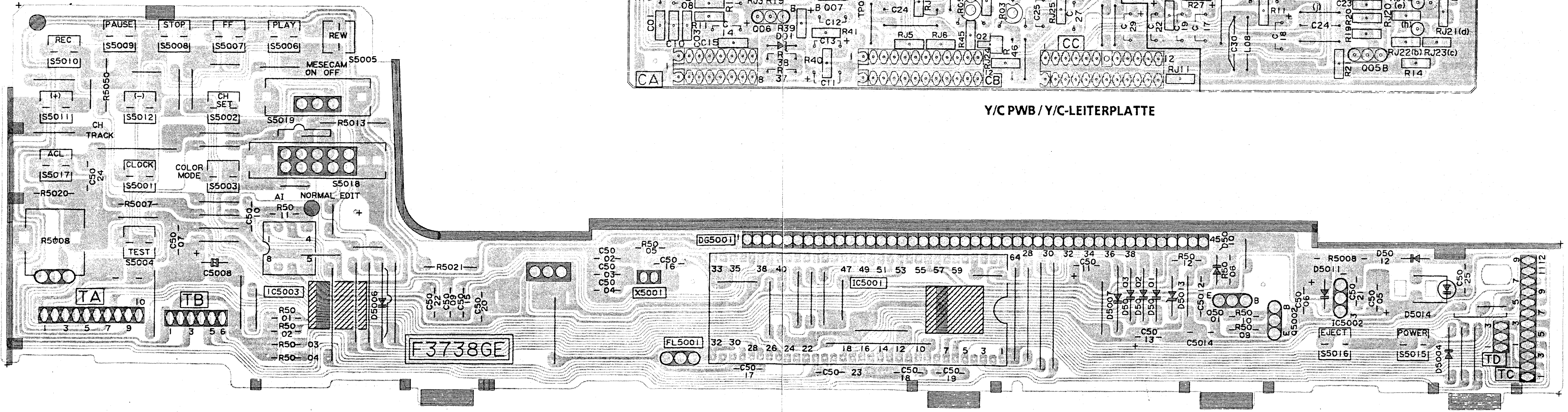
HEAD AMP PWB / KOPFVORVERSTÄRKER-LEITERPLATTE


RF CONV
J6601
VIDEO OUT IN
AUDIO OUT IN
SC2201
TUNER
BU
VT
BH
AGC
BL
MB
IF
AFT
BHYP
ANT
IF PACK
IC1451
IC2201
TP1551
F3728GE
AI

TUNER-IF PWB / TUNER-ZF-LEITERPLATTE


CRNO 5**
CRNO 2**
CRNO 5**
CRNO 2**
IC401
IC402
TP01
TP02
TP03
CA
CB
CC

Y/C PWB / Y/C-LEITERPLATTE


REC
PAUSE
STOP
FF
PLAY
REW
S5010
S5009
S5008
S5007
S5006
S5005
MESECAM ON OFF
(+)
(-)
CH SET
S5011
S5012
S5002
S5019
R5013
CH TRACK
ACL
CLOCK
COLOR MODE
S5017
S5001
S5003
S5018
AI
NORMAL EDIT
TEST
S5004
TA
TB
IC5003
IC5001
DG5001
X5001
FL5001
F3738GE
EJECT
POWER
S5016
S5015
TC
TD

TIMER PWB / TIMER-LEITERPLATTE

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by ⚠ and shaded areas in the Replacement Parts Lists and Schematic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION
5. PRICE CODE

ERSATZTEILLISTE

AUSWECHSELN VON BAUTEILEN

Viele der elektrischen und mechanischen Teile im Videorecorder besitzen spezielle sicherheitsberzogene Merkmale. Diese Markmale können oft nicht durch einfache visuelle Überprüfung festgestellt werden. Diesen Bauteilen können auch nicht die satzteile z.B. für höhere Spannung, Leistung usw. eingebaut werden. Ersatzteile, welche diese speziellen Sicherheitsmerkmale aufweisen, sind in dieser Anleitung gekennzeichnet. Elektrische Bauteile mit diasen Merkmalen werden mit den Symbol " ⚠ " gekennzeichnet sowie als schraffierte Flächen in den Ersatzteillisten und schematischen Schaltbildern dargestellt. Der Einbau von Ersatzteilen, die nicht die vom Hersteller in dieser Anleitung empfohlenen Sicherheitsmerkmale aufweisen, können Stromschlag, Brand oder andere Gehahren hervorrufen.

"BESTELLUNG VON ERSATZTEILEN"

Zur schnellen und korrekten Ausführung der Bestellung sind folgende Angaben erforderlich:.

1. MODELLNUMMER
2. BEZUGSNUMMER
3. ERSATZTEILNUMMER
4. BESCHREIBUNG
5. PREISKODE

⚠ MARK: SAFETY RELATED PARTS **⚠-MARKIERUNG: SICHERHEITSTEILE**

★MARK: SPARE PARTS-DELIVERY SECTION **★-MARKIERUNG: ERSATZTEILE-LIEFERUNG**

PWB ASSEMBLY IS NOT REPLACEMENT ITEM **DIE LEITERPLATTE-MONTAGE IST KEIN ERSATZTEIL**

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
			MAIN (SERVO, SYSTEM-CONTROL, TUNER) CIRCUIT	**HAUPTSCHALTUNG (SERVO, SYSTEMSTEUERUNG, TUNER)**	
	DUNTK3724TEV4	-	Main Board Assembly	Hauptplatteneinheit	—
			TRANSISTORS	**TRANSISTOREN**	
Q602	VS2C3939SQR-1	J	2SC3939SQR		AC
	or				
	VS2SC1509R/-1	J	2SC1509R		AD
Q603	VS2SD655-DE1E	J	2SD655-DE		AC
Q604, 953	VSDTA124EK/-1	J	DTA124EK		AB
Q701, 803, 804, 951, 954, 958, 960, 2303, 2310, 2320, 2402, 5503, 5803, 5804	VS2SC2412KQ-1	J	2SC2412KQ		AA

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
Q703, 704, 705, 707, 2315, 5802	VS2SA1037KQ-1	J	2SA1037KQ		AA
Q706, 805, 1801, 5602, 5805	VS2C1740SQR1E	J	2SC1740SQR		AC
Q806	VS2SC1318QR-1	U	2SC1318QR		AC
Q952, 955, 959, 961	VS2SD471-KL1E	J	2SD471-KL		AC
Q956, 1402	VS2SA988///1E	J	2SA988		AB
Q957	VS2SA1271-Y-1	J	2SA1271-Y		AB
Q962, 963, 2305, 2306, 2401, 8803	VSDTC144EK/-1	J	DTC144EK		AB
Q1401	VS2SC383-WT-1	J	2SC383-WT		AE
Q2304, 2312, 2313	VS2SA933SQR1E	J	2SA933SQR		AB
Q2311	VSDTC144ES/-1	J	DTC144ES		AB
Q2314	VSDTA124ES/-1	J	DTA124ES		AB
Q2321, 8804	VSDTA144EK/-1	J	DTA144EK		AC

INTEGRATED CIRCUITS INTEGRIERTE SCHALTKREISE

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
IC601	VHiBA7765AS-1	J			AL
IC701	RH-iX0981GEZZ	J			AH
IC801	RH-iX0723GEZZ	J			AX
	or				
	RH-iX0725GEZZ	J			AX
IC802	VHiPST529D2-1	J			AD
IC803	VHiBA6209//-1	J			AK
IC1401	VHiUPC574JT-1	J			AC
IC1801	VHiSDA5642/-1	J			AY
IC2401	VHiLA7210//-1	J			AH
IC5601	VHiBA7007//-1	J			AM

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
			DIODES AND CRYSTAL	**DIODEN UND QUARZ**	
D702 | 707, 801, 802, 803, 960, 962, 2304, 2310 | 2313, 2315, 2316, 5603, 5604, 5606, 5801	RH-DX0053GEZZ	J	1SS132		AA
D951, 954	VHDSR1M-2//-1	J	SR1M-2		AA
D952	RH-EX0366GEZZ	J	HZS5B2		AA
D953, 955	RH-EX0367GEZZ	J	HZS5B3		AA
D956	RH-EX0368GEZZ	J	HZS5C1		AA
D957, 958	RH-EX0374GEZZ	J	HZS6B1		AA
D959	RH-EX0281CEZZ	J	UZ3.3BSA		AA
D961, 963	RH-EX0272CEZZ or	J	UZ2.0BSB		AA
	RH-EX0273CEZZ	J	UZ2.0BSA		AA
D1401	RH-EX0377GEZZ	J	HZS6C1		AA
X801	RCRSB0136GEZZ	J	Crystal, 7.16MHz	Quarz	AF
			CONTROLS	**REGLER**	
R607	RVR-M4415GEZZ or	J	10k(B), PB Level Adj.	Wiedergabe-Pegeleinstellung	AB
	RVR-M4626GEZZ	J			AB
R625	RVR-M4425GEZZ or	J	470k(B), Bias Adj.	Vorspannungspegeleinstellung	AB
	RVR-M4349GEZZ	J			AB
R701	RVR-M4632GEZZ	J	100k(B), PG Adj. (PAL)	Phasengenerator-Einstellung	AB
R2357	RVR-M4334GEZZ	J	10k(B), Picture CTL Adj.	Bildregler	AB
			COILS AND TRANSFORMER	**SPULEN UND TRANSFORMATOR**	
DL5801	RCiLZ0183GEZZ	J	Delay Line	Vorzögerungsleitung	AK
FL2401	RFiLA0020GEZZ	J	Filter	Filter	AC
FL5601	RFiLC0029TAZZ	J	Filter	Filter	AD
L601	VP-YF822J0000	J	8.2mH		AC

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
L602	VP-CF221K0000	J	220µH		AB
L1401, 5802	VP-XF120K0000	J	12µH		AB
L1801, 5501	VP-MK221K0000	J	220µH		AB
L2301	VP-XF151K0000	J	150µH		AB
L5601	VP-YF153J0000	J	15mH		AC
L5602	VP-DF221K0000	J	220µH		AB
L5801	VP-DF101K0000	J	100µH		AB
T601	RTRNH0053GEZZ	J	Osc. Transformer	Schwingungstransformator	AE
			CAPACITORS	**KONDENSATOREN**	
C605	VCQYTA1HM123K	U	0.012µF, 50V, 10%, Mylar	Mylar	AA
C610	VCEAEA1AW107M	J	100µF, 10V, 20%, Electrolytic	Elektrolytisch	AB
C611, 722	VCE9EA1HW105M	J	1µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C619, 2403	VCQYTA1HM223K	U	0.022µF, 50V, 10%, Mylar	Mylar	AA
C620	VCQYWA1HA153J	J	0.015µF, 50V, 5%, Mylar	Mylar	AA
C628	VCQPSA2AA562J	J	5600pF, 100V, 5%, Plastic Film	Kunststoffilm	AC
C629	VCRYPA1HA221J	J	220pF, 50V, 5%, Ceramic	Keramik	AB
C701, 715	RC-QZY473UMYK	U	0.047µF, 50V, 5%, Mylar	Mylar	AA
C710, 714, 801	VCEAEA0JW107M	J	100µF, 6.3V, 20%, Electrolytic	Electrolytisch	AB
C717	VCE9EA1HW225M	J	2.2µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AB
C727, 1811	VCQYTA1HM104K	J	0.1µF, 50V, 5%, Mylar	Mylar	AB
C732	VCE9EA1CW226M	J	22µF, 16V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C735	VCQYTA1HM103K	U	0.01µF, 50V, 10%, Mylar	Mylar	AA
C814, 2407	VCEAEA1CW107M	J	100µF, 16V, 20%, Electrolytic	Elektrolytisch	AC
C815	RC-KZ0017GEZZ	J	0.047µF, 16V, Ceramic	Keramik	AA
C816	VCE9EA1HW335M	J	3.3µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AB
C1401, 1402	VCFYSA1HB334J	J	0.33µF, 50V, 5%, Mylar	Mylar	AB
C1802	VCQYTA1HM333K	J	0.033µF, 50V, 10%, Mylar	Mylar	AE
C1810, 2307, 2409	VCE9EA1CW106M	J	10µF, 16V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C2303	RC-KZ0029GEZZ	J	22µF, 10V, Ceramic	Keramik	AA
C5603	VCQYTA1HM273K	U	0.027µF, 50V, 10%, Mylar	Mylar	AA
			RESISTORS	**WIEDERSTÄNDE**	
R723, 724	VRN-RA2BK273F	J	27k ohm, 1/8W, 1%, Metal Film	Metallshicht	AA

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
L602	VP-CF221K0000	J	220µH		AB
L1401, 5802	VP-XF120K0000	J	12µH		AB
L1801, 5501	VP-MK221K0000	J	220µH		AB
L2301	VP-XF151K0000	J	150µH		AB
L5601	VP-YF153J0000	J	15mH		AC
L5602	VP-DF221K0000	J	220µH		AB
L5801	VP-DF101K0000	J	100µH		AB
T601	RTRNH0053GEZZ	J	Osc. Transformer	Schwingungstransformator	AE
			CAPACITORS	**KONDENSATOREN**	
C605	VCQYTA1HM123K	U	0.012µF, 50V, 10%, Mylar	Mylar	AA
C610	VCEAEA1AW107M	J	100µF, 10V, 20%, Electrolytic	Elektrolytisch	AB
C611, 722	VCE9EA1HW105M	J	1µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C619, 2403	VCQYTA1HM223K	U	0.022µF, 50V, 10%, Mylar	Mylar	AA
C620	VCQYWA1HA153J	J	0.015µF, 50V, 5%, Mylar	Mylar	AA
C628	VCQPSA2AA562J	J	5600pF, 100V, 5%, Plastic Film	Kunststoffilm	AC
C629	VCRYPA1HA221J	J	220pF, 50V, 5%, Ceramic	Keramik	AB
C701, 715	RC-QZY473UMYK	U	0.047µF, 50V, 5%, Mylar	Mylar	AA
C710, 714, 801	VCEAEA0JW107M	J	100µF, 6.3V, 20%, Electrolytic	Electrolytisch	AB
C717	VCE9EA1HW225M	J	2.2µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AB
C727, 1811	VCQYTA1HM104K	J	0.1µF, 50V, 5%, Mylar	Mylar	AB
C732	VCE9EA1CW226M	J	22µF, 16V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C735	VCQYTA1HM103K	U	0.01µF, 50V, 10%, Mylar	Mylar	AA
C814, 2407	VCEAEA1CW107M	J	100µF, 16V, 20%, Electrolytic	Elektrolytisch	AC
C815	RC-KZ0017GEZZ	J	0.047µF, 16V, Ceramic	Keramik	AA
C816	VCE9EA1HW335M	J	3.3µF, 50V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AB
C1401, 1402	VCFYSA1HB334J	J	0.33µF, 50V, 5%, Mylar	Mylar	AB
C1802	VCQYTA1HM333K	J	0.033µF, 50V, 10%, Mylar	Mylar	AE
C1810, 2307, 2409	VCE9EA1CW106M	J	10µF, 16V, 20%, Electrolytic (N.P.)	Elektrolytisch (ungepolt)	AC
C2303	RC-KZ0029GEZZ	J	22µF, 10V, Ceramic	Keramik	AA
C5603	VCQYTA1HM273K	U	0.027µF, 50V, 10%, Mylar	Mylar	AA
			RESISTORS	**WIEDERSTÄNDE**	
R723, 724	VRN-RA2BK273F	J	27k ohm, 1/8W, 1%, Metal Film	Metallshicht	AA

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
			MISCELLANEOUS	**SONSTIGE TEILE**	
	QPLGN0228TAZZ	J	Plug, 2 pin (TP601-602, TP2301-2)	Stecker, 2 polig (TP601-602, TP2301-2)	AB
	QPLGN0278GEZZ	J	Plug, 2 pin (AY)	Stecker, 2 polig (AY)	AA
	QPLGN0328TAZZ	J	Plug, 3 pin (TP2201-2203)	Stecker, 3 polig (TP2201-2203)	AD
	QPLGN0378GEZZ	J	Plug, 3 pin (AC, AG)	Stecker, 3 polig (AC, AG)	AB
	QPLGN0578GEZZ	J	Plug, 5 pin (AB, AX)	Stecker, 5 polig (AB, AX)	AB
	QPLGN0678GEZZ	J	Plug, 6 pin (AL)	Stecker, 6 polig (AL)	AB
	QPLGN0878GEZZ	J	Plug, 8 pin (AK)	Stecker, 8 polig (AK)	AC
	QPLGN0879GEZZ	J	Plug, 8 pin (AS)	Stecker, 8 polig (AS)	AB
	QPLGN0978GEZZ	J	Plug, 9 pin (AP, AM)	Stecker, 9 polig (AP, AM)	AC
	QPLGN1279GEZZ	J	Plug, 12 pin (AT, AU)	Stecker, 12 polig (AT, AU)	AC
	QSOCN0594UMZZ	U	Socket, 5 pin (AE)	Anschluß, 5 polig (AE)	AB
	QSOCN0694UMZZ	U	Socket, 6 pin (AD)	Anschluß, 6 polig (AD)	AB
	QSOCN1270REZZ	J	Socket, 12 pin (AH)	Anschluß, 12 polig (AH)	AC
	QSOCN1594UMZZ	U	Socket, 15 pin (AF)	Anschluß, 15 polig (AF)	AC
	QSOCN2694UMZZ	U	Socket, 26 pin (AJ)	Anschluß, 26 polig (AJ)	AD
			Y/C CIRCUIT	**Y/C SCHALTUNG**	
	DUNTK3722TEV3	-	Y/C Board Assembly	Y/C-Platteneinheit	—
			TRANSISTORS	**TRANSISTOREN**	
Q201, 202, 204, 212 | 215	VS2SC2412KQ-1	J	2SC2412KQ		AA
Q205	VCDTC144ES/-1	J	DTC144ES		AB
Q206	VS2SD471-KL1E	J	2SD471-KL		AC
Q207, 218, 502, 505	VS2C1740SQR1E	J	2SC1740SQR		AC
Q208	VSDTA144ES/-1	J	DTA144ES		AB
Q219, 501	VS2SA933SQR1E	J	2SA933SQR		AB
Q503	VSDTC144EK/-1	J	DTC144EK		AB
			INTEGRATED CIRCUITS	**INTEGRIERTE SCHALTKREISE**	
IC401	RH-iX0986GEZZ	J			AV
IC402	VHiLC8992//-1	J			AK

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
			DIODES AND CRYSTAL	**DIODEN UND QUARZ**	
D201	RH-EX0616GEZZ	J	Zener Diode	Zener-Diode	AA
D202, 203	RH-DX0053GEZZ	J	1SS132		AA
X501	RCRSB0114GEZZ	J	Crystal, 4.43MHz	Quarz	AG
			CONTROLS	**REGLER**	
R201,	RVR-M4415GEZZ	J	10k(B), PB Y Level Adj.	Wiedergabe-Y-Pegeleinstellung	AB
203,			10k(B), EE Level Adj.	EE-Pegeleinstellung	
205			10k(B), FM Carrier Adj.	FM-Trägareinstellung	
R204	RVR-M4414GEZZ	J	6.8k(B), Deviation Adj.	Hubeinstellung	AB
R208	RVR-M4409GEZZ	J	1k(B), REC FM Level Adj.	Aufnahme-FM-Pegeleinstellung	AB
R504	RVR-M4411GEZZ	J	2.2k(B), REC C Level Adj.	Aufnahme-C-Pegeleinstellung	AB
			COILS AND DELAY LINE	**SPULEN UND VORZÖGERUNGSLEITUNG**	
DL501	RCiLZ0292GEZZ	J	Delay Line	Vorzögerungsleitung	AP
	or				
	RCiLZ0289GEZZ	J			AP
L201	VP-XF150K0000	J	15µH		AB
L202	VP-XF330K0000	J	33µH		AB
L203, 215	VP-XF180K0000	J	18µH		AB
L205, 207	VP-XF151K0000	J	150µH		AB
L206, 209	VP-XF680K0000	J	68µH		AB
L208	VP-DF470K0000	J	47µH		AB
L210	VP-XF270K0000	J	27µH		AB
L211	VP-XF560K0000	J	56µH		AB
L213	VP-MK120K0000	J	12µH		AB
L214	VP-MK221K0000	J	220µH		AB
L217	VP-XF5R6K0000	J	5.6µH		AB
L501	VP-MK561K0000	J	560µH		AB
L502, 503	VP-XF221K0000	J	220µH		AB
L504	VP-DF220K0000	J	22µH		AB
L507	VP-MK181K0000	J	180µH		AB
			CAPACITORS	**KONDENSATOREN**	
C227	VCEAEA1AW107M	J	100µF, 10V, 20%, Electrolytic	Elektrolytisch	AB
C245, 508	RC-KZ0017GEZZ	J	0.047µF, 16V, Ceramic	Keramik	AA
C511	VCQYTA1HM123K	U	0.012µF, 50V, 10%, Mylar	Mylar	AA
C514	VCFYSA1HB473J	J	0.047µF, 50V, 5%, Mylar	Mylar	AA
C516	VCQYTA1HM223K	U	0.022µF, 50V, 10%, Mylar	Mylar	AA
C519	RC-QZY473UMYK	U	0.047µF, 50V, 5%, Mylar	Mylar	AA

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
			MISCELLANEOUS	**SONSTIGE TEILE**	
	QSOCN0879GEZZ	J	Socket, 8 pin (CA)	Anschluß, 8 polig (CA)	AC
	QSOCN1279GEZZ	J	Socket, 12 pin (CB, CC)	Anschluß, 12 polig (CB, CC)	AC
			HEAD AMP. CIRCUIT	**KOPFVORVERSTÄRKERSCHALTUNG**	
	DUNTK3721TEV1	-	HEAD AMP. Board Assembly	Kopfvorverstärkerplateneinheit	—
			INTEGRATED CIRCUIT	**INTEGRIERTE SCHALTKREIS**	
IC301	VHiBA7279S/-1	J			AL
			COILS	**SPULEN**	
L301, 307	VP-MK101K0000	J	100µH		AB
			CAPACITORS	**KONDENSATOREN**	
C307	VCFYSA1HB473J	J	0.047µF, 50V, 5%, Mylar	Mylar	AA
C314, 317	RC-KZ0029GEZZ	J	0.1µF, Ceramic	Keramik	AA
C326	VCFYSA1HB333J	J	0.033µF, 50V, 5%, Mylar	Mylar	AE
			MISCELLANEOUS	**SONSTIGE TEILE**	
	QPLGN0229TAZZ	J	Plug, 2 pin (TP301-302)	Stecker, 2 polig (TP301-302)	AB
	QSOCN0732REZZ	J	Socket, 7 pin (XA)	Anschluß, 7 polig (XA)	AC
	QSOCN1271REZZ	J	Socket, 12 pin (XB)	Anschluß, 12 polig (XB)	AC
			TIMER CIRCUIT	**TIMER SCHALTUNG**	
	DUNTK3738TEV5	-	Timer Board Assembly	Timerplatteneinheit	—
			TRANSISTORS	**TRANSISTOREN**	
Q5001	VS2SA1561R/1E	J	2SA1561R		AB
Q5002	VSDTC124ELT-1	J	DTC124ELT		AA
			INTEGRATED CIRCUITS	**INTEGRIERTE SCHALTKREISE**	
IC5001	RH-iX0822GEZZ	J			AW
IC5002	VHiPST529i2-1	J			AD

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
IC5003	VHiBR93C46A-1	J			AG
	or				
	VHiCAT93C46-1	J			AN
			DIODES AND CRYSTAL	**DIODEN UND QUARZ**	
D5001	RH-DX0053GEZZ	J	1SS132		AA
|	or				
5004,	RH-DX0048GEZZ	J	1N4531		AA
5010,					
5011,					
5012					
D5013	RH-EX0152GEZZ	J	9.2B2		AA
D5014	RH-PX0204GEZZ	J	Photodiode	Leuchdiode	AB
X5001	RCRSB0090GEZZ	J	Crystal	Quarz	AE
			FILTER	**FILTER**	
FL5001	RFiLC0118GEZZ	J			AC
			CAPACITOR	**KONDENSATOR**	
C5006	RC-EZ0390GEZZ		0.047µF, 5.5V, +80~−20%, Electrolytic	Elektrolytisch	AF
			MISCELLANEOUS	**SONSTIGE TEILE**	
DG5001	VVK7MT119GK-1	J	Fluorescent Display Tube	Leuchtstoffanzeigebildröhre	AU
	QPLGN0378GEZZ	J	Plug, 3 pin (TD)	Stecker, 3 polig (TD)	AB
	QPLGN0678GEZZ	J	Plug, 6 pin (TB)	Stecker, 6 polig (TB)	AB
	QPLGN0878GEZZ	J	Plug, 8 pin (TA)	Stecker, 8 polig (TA)	AC
	QPLGN0978GEZZ	J	Plug, 9 pin (TC)	Stecker, 9 polig (TC)	AC
	RRMCU0044GEZZ	J	R/C Receiver	Fernbedienungsempfänger	AL
S5001,	QSW-K0079GEZZ	J	Switch, Clock	Schalter, Takt	AB
5002,			Switch, Channel Set	Schalter, Kanaleinstellung	
5003,			Switch, Colour	Schalter, Farbe	
5004,			Switch, Test	Schalter, Probe	
5005,			Switch, Rewind	Schalter, Rücklauf	
5006,			Switch, Playback	Schalter, Wiedergabe	
5007,			Switch, Fast Forward	Schalter, Schnellvorlauf	
5008,			Switch, Stop	Schalter, Stopp	
5009,			Switch, Pause	Schalter, Pause	
5010,			Switch, Recording	Schalter, Aufnahme	
5011,			Switch, Channel Up	Schalter, Kanal-Auf	
5012,			Switch, Channel Down	Schalter, Kanal-Ab	
5015,			Switch, Power	Schalter, Netz	
5016,			Switch, Eject	Schalter, Answurt	
5017			Switch, ACL	Schalter, Ganze Löschung	
S5018	QSW-S0232GEZZ	J	Switch, Auto Picture ON/OFF	Schalter, Automatisches Bild-EIN/AUS	AD
			IF/TUNER CIRCUIT	**ZF/TUNER SCHALTUNG**	
	DUNTK3728TEV3	-	IF/Tuner Board Assembly	ZF/Tuner-Platteneinheit	—

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
330	MSPRT0281GEFJ	J	Slider Lock Spring	Verstellerverriegelungsfeder	AA
331	MSLiF0044GEFW	J	Slider	Versteller	AF
332	MLEVP0137GE00	J	Lock Release Lever	Verriegelungs-Freigabehebel	AA
333	MSPRD0093GEFJ	J	Lock Release Lever Spring	Verriegelungs-Freigabehebelfeder	AA
334	MLEVP0143GE00	J	Slider Lock Cover	Verstellerverriegelungsabdeckung	AA
335	LANGF9356GEFW	J	Slider Lock (Right)	Verstellerverriegelung (rechts)	AA
336	LHLDX1010GE00	J	Slider Holder (Right)	Verstellerhalter (rechts)	AB
337	NGERW1035GEZZ	J	Drive Gear (Left)	Antriebszahnrad (links)	AB
338	MSPRD0089GEFJ	J	Drive Gear Spring (Left)	Antriebszahnradfeder (links)	AA
339	LHLDX1015GE00	J	Cassette Housing Frame (Left)	Cassettengehäuserahmen (links)	AC
340	NSFTD0015GEFD	J	Main Shaft	Hauptwelle	AD
341	QPWBF2894GEZZ	J	End Sensor PWB	Endsensor-Leiterplatte	AB
342	RH-PX0176GEZZ	J	Phototransistor	Phototransistor	AE
343	QPWBF3194GEZZ	J	Start Sensor PWB	Startsensor-Leiterplatte	AC
344	QSW-F0040GEZZ	J	Cassette Switch	Cassettenschalter	AD
345	ZTAPEZ790008E	J	Rubber Mat	Gummipuppe	AA
347	QSOCN0595GEZZ	J	Socket, 5 pin	Anschluß, 5 polig	AB
348	VSDTC124F//-1	J	Transistor	Transistor	AC
349	VS2SA937-Q/-1	J	Transistor	Transistor	AC
350	VRD-RA2BE153J	J	15k ohm, 1/8W, 5%, Carbon	Kohle	AA
351	VRD-RA2BE223J	J	22k ohm, 1/8W, 5%, Carbon	Kohle	AA
352	VRD-RA2BE103J	J	10k ohm, 1/8W, 5%, Carbon	Kohle	AA
353	VRD-RA2BE472J	J	4.7k ohm, 1/8W, 5%, Carbon	Kohle	AA
354	VRD-RA2BE332J	J	3.3k ohm, 1/8W, 5%, Carbon	Kohle	AA
355	RC-KZ0028GEZZ	J	0.047µF, 16V, 20%, Ceramic	Keramik	AA
356	QCNW-4789GEZZ	J	Connecting Cord	Anschlußkabel	AF
401	LX-WZ1020GE00	J	Cut Washer (4.2W-6.0-0.5)	C-Scheibe (4,2W-6,0-0,5)	AA
402	LX-HZ3046GEFD	J	Screw (B Tight BTN3P + 6S)	Schraube	AA
403	NPLYV0137GEZZ	J	Coupling	Riemenscheibe	AA
404	NPLYV0136GEZZ	J	Clutch	Kupplungs	AA
405	NGERW1037GEZZ	J	Worm	Schnecken	AA
406	PSPAZ0301GEZZ	J	Spacer	Anstandsstück	AD

SCREWS, NUTS, AND WASHERS

SCHRAUBEN, MUTTERN UND UNTERLAGSCHEIBEN

201	XNFSD20-16000	J	Adjusting Nut	Einstellmutter	AA
202	XWHSD26-05060	J	Washer W2.6S-6-0.5	Unterlegscheibe W2,6S-6-0,5	AA
203	XRESJ20-04000	J	E Ring-2	E-Ring-2	AA
204	LX-BZ3095GEFD	J	AC Head Screw	Tonkopf-Einstellschraube	AA
205	XBPSD26P06000	J	Azimuth Adjusting Screw	Azimuth-Einstellschraube	AA
206	LX-BZ3096GEFD	J	Tilt Adjusting Screw	Neigwinkel-Einstellschraube	AA
207	XNFSD40-31000	J	Adjusting Nut (A/C Head)	Einstellmutter (Tonkopf)	AB
208	LX-WZ1048GE00	J	Washer W3.1-5.4-0.5	Unterlegscheibe W3,1-5,4-0,5	AA
209	LX-WZ1041GE00	J	Washer W2.6-6-0.5 (LM)	Unterlegscheibe W2,6-6-0,5 (LM)	AA
210	XHPSD26P06WS0	J	Screw C2.6P + 6S	Schraube C2,6P + 6S	AA
211	XRESJ30-06000	J	E Ring-3	E-Ring-3	AA
212	XWHJZ45-02060	J	Washer PSW4.5-6-0.25	Unterlegscheibe PSW4,5-6-0,25	AA
213	LX-NZ3046GEFW	J	Adjusting Nut	Einstellmutter	AB
215	LX-WZ1003GE00	J	Washer CW2.1-5-0.5	Unterlegscheibe CW2,1-5-0,5	AA
216	XRESJ12-03000	J	E Ring-1.2-T0.3	E-Ring-1.2	AA
217	XHPSD26P03000	J	Screw S2.6P + 3S (S Tight)	Schraube S2.6P + 3S	AA
218	XHPSD20P03000	J	Screw S2P + 3S (S Tight)	Schraube S2P + 3S	AA
219	XRESJ25-04000	J	E Ring-2.5	E-Ring-2.5	AA

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
220	XWHJZ25-05050	J	Washer W2.6P-5-0.5	Unterlegscheibe W2,6P-5-0,5	AA
221	XWHJZ25-01050	J	Washer W2.6P-5-0.13	Unterlegscheibe W2,6P-5-0,13	AA
222	XWHJZ25-02050	J	Washer W2.6P-5-0.25	Unterlegscheibe W2,6P-5-0,25	AA
223	LX-HZ3043GEZZ	J	Screw W2.6P + 6S	Schraube W2,6P + 6S	AA
224	LX-BZ3099GEZZ	J	Screw WSW2P + 11S (W5)	Schraube WSW2P + 11S (W5)	AB
225	LX-XZ3030GEFD	J	Screw M2x4	Schraube M2x4	AC
226	XHPSD26P08WS0	J	Screw C2.6P + 8S	Schraube C2,6P + 8S	AA
227	XJPSD26P08WS0	J	B Tight Screw C2.6 + 8S	"B-Tight"-Schraube C2,6 + 8S	AA
228	XHPSD30P08WS0	J	Screw C3P + 8S	Schraube C3P + 8S	AA
229	LX-WZ1040GE00	J	Washer CW2.5-6-0.5	Unterlegscheibe CW2,5-6-0,5	AA
230	XJBSD20P06000	J	B Tight Screw 2P + 6S	"B-Tight"-Schraube 2P + 6S	AA
231	LX-BZ3039GEFN	J	Screw W3P + 9S-Ni	Schraube W3P + 9S-Ni	AA
232	LX-HZ3056GEFD	J	Screw WSW3P + 10S-6W	Schraube WSW3P + 10S-6W	AA
233	XBPSD30P08J00	J	Screw SW3P + S8S	Schraube SW3P + 8S	AA
234	XBPSD26P12J00	J	Screw SW2.6 + 12S	Schraube SW2,6 + 12S	AA
235	XBPSD30P05J00	J	Screw SW3P + 5S	Schraube SW3P + 5S	AA
237	XHPSD30P06000	J	Screw S3P + 6S	Schraube S3P + 6S	AA
238	LX-RZ3001AEZZ	J	E Ring-3 (Curl)	E-Ring-3	AA
239	LX-WZ1042GE00	J	Washer CW2.7-7-0.5	Unterlegscheibe CW2,7-7-0,5	AA
242	XWHJZ25-04050	J	Washer W2.6P-5-0.4	Unterlegscheibe W2,6P-5-0,4	AA
244	XHPSD30P04WS0	J	Screw C3P + 4S	Schraube C3P + 4S	AA

MECHANICAL PARTS MECHANISCHE TEILE

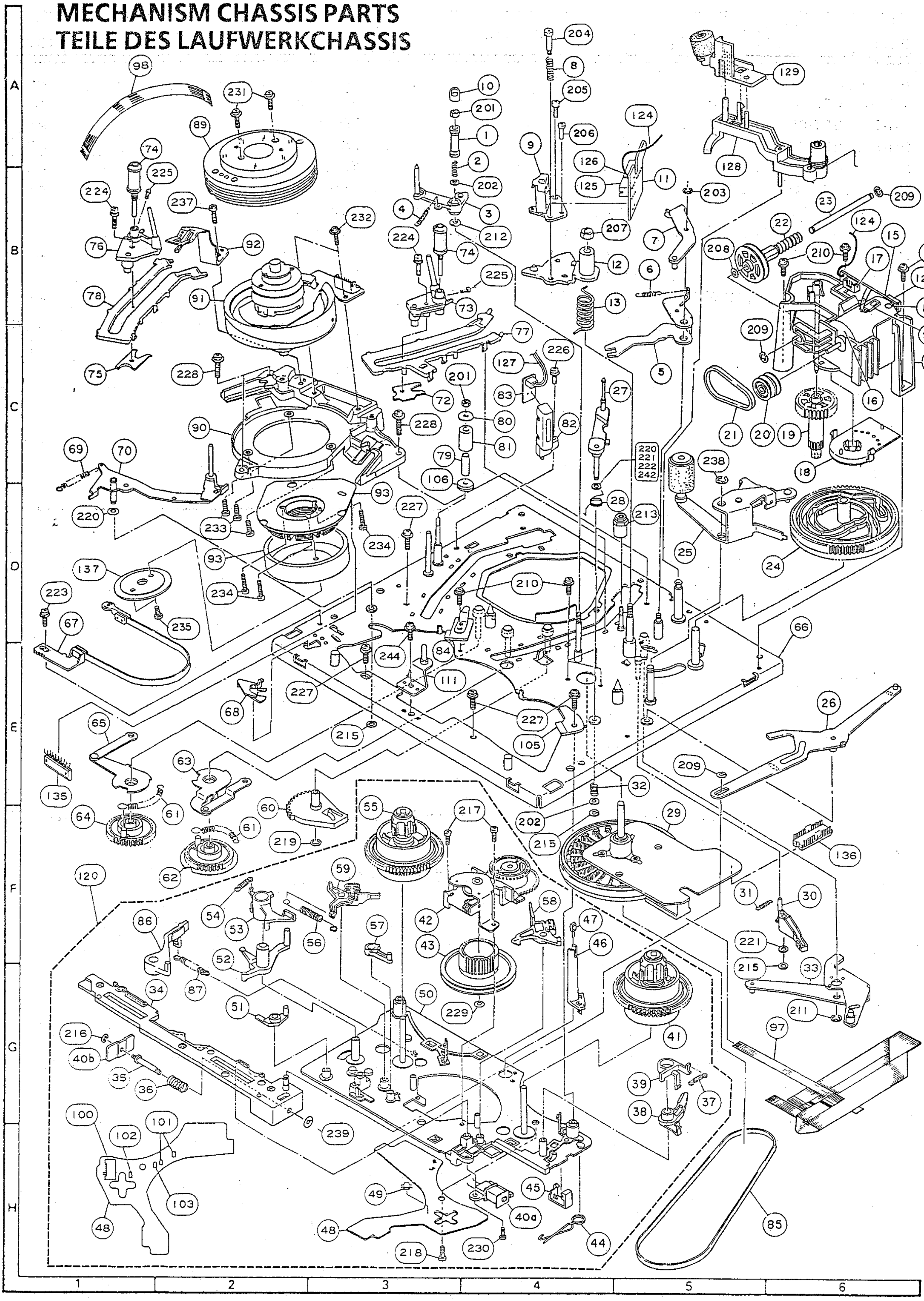
REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
601	CCABB1118TEV0	U	Main Frame Ass'y	Hauptrahmeneinheit	AR
601-1	GCABB1118UMZZ	U	Main Frame	Hauptrahmen	AR
601-2	PGUMR0007GEZZ	J	Foot Rubber	Gummipuppe	AC
602	GCABA3072UMST	U	Top Cabinet	Obere Gehäuseeinheit	AT
603	GBDYU3075UMZZ	U	Bottom Plate	Bodenplatte	AH
604	GCOVA1673UMZZ	U	Antenna Terminal Cover	Antennenanschlußdeckel	AB
605	LHLDP1089UM00	U	LED Holder	Leuchtdioden-Halter	AA
606	LHLDZ1780UMZZ	U	Holder, Power	Halter, Netz	AA
607	LHLDZ1794GEZZ	J	Holder, Fluorescent Display Tube	Halter, Leuchtstoffanzeigebildröhre	AC
608	LHLDZ1779UMZZ	U	Holder, RF Converter	Halter, Hochfrequenzwandler	AA
609	MHNG-1060GEZZ	J	Hinge, Main PWB	Scharnier, Hauptplatte	AA
610	QEARP0360UMFW	U	Earth Plate	Erdungsplatte	AA
611	TLABM0111UMZZ	U	Label, Model	Modelletikett	AH
612	LX-HZ3040GEFF	J	Screw	Schraube	AA
613	LX-HZ3047GEFF	J	Screw	Schraube	AA
614	XEBSD40P12000	J	Screw	Schraube	AA
616	XHPS330P06WS0	J	Screw	Schraube	AA
617	XEBSD30P12000	J	Screw	Schraube	AA
618	LANGF9467GEFW	J	Fixing Metal	Befestigungsstück	AB
619	LANGF5060GEFW	J	Angle	Winkelstütze	AB
620	LX-HZ3056GEFD	J	Screw	Schraube	AA
621	PSPAZ0317GEZZ	J	Spacer	Anstandsstück	AA

FRONT PANEL PARTS FRONTTEILE

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
501	CPNLC1690TEV0	U	Front Panel Ass'y	Fronttafeleinheit	
501-1	CBTN-2501TEV0	U	Operation/Eject Button Ass'y	Betriebs-/Auswurftasteneinheit	AD

REF. NO. REF. NR.	PART NO. TEIL NR.	★	DESCRIPTION	BESCHREIBUNG	CODE KODE
501-1-1	JBTN-2501UMSA	U	Button	Taste	AC
501-1-2	GCOVA1683UMSA	U	Cover	Abdeckung	AE
501-2	GDORF1946UMSA	U	Door	Tür	AH
501-3	HBDGB1007GESA	J	Badge "SHARP"	Schild "SHARP"	AD
501-4	HDECQ0842UMSA	U	Cassette Compartment Cover	Cassettenfachdeckel	AG
501-5	HDECQ0801UMSB	U	Display Cover	Anzeigeabdeckung	AH
501-6	HDECQ0802GESB	J	Decoration Plate	Zierverkleidung	AL
501-7	HiNDP1838UMSA	U	Indication Plate	Kennplatte	AH
501-8	HPNLC1690UMSA	U	Front Panel	Frontplatte	AR
501-9	JBTN-2508UMSA	U	Button	Taste	AB
501-10	LANGF9522UMFW	U	Fixing Metal	Befestigungsstück	AA
501-11	LHLDS1010UMZZ	U	Door Latch	Türverschlu	AB
501-12	MSPRD0123GEFJ	J	Spring	Feder	AA
501-13	PCOVU9200GESB	J	Fluorescent Display Filter	Leuchtstoffanzeigefilter	AF
501-14	QEARP0354UMFW	U	Earth Plate	Erdungsplatte	AA
501-15	QEARP0355UMFW	U	Earth Plate	Erdungsplatte	AB
501-16	TLABZ0852GEZZ	J	Feature Label	Merkmaltikette	AC
501-17	XJPSD20P06XS0	J	Screw	Schraube	AA
501-18	TLABH0492UMZZ	U	Label (Inside the door)	Etikette (Innerhalb der Tür)	AF

MECHANISM CHASSIS PARTS
TEILE DES LAUFWERKCHASSIS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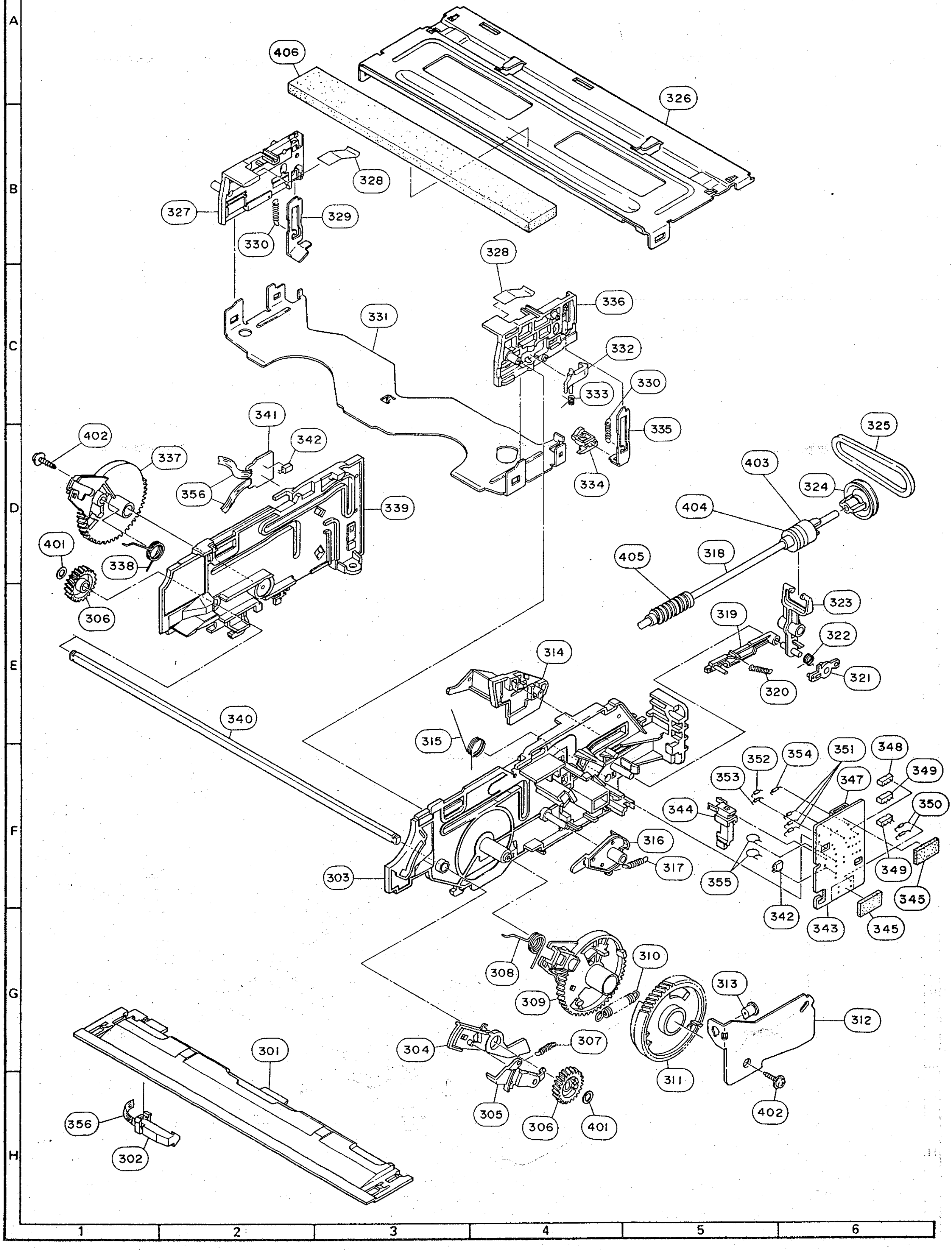
CASSETTE HOUSING CONTROL PARTS
CASSETTENGEHÄUSE-REGELTEILE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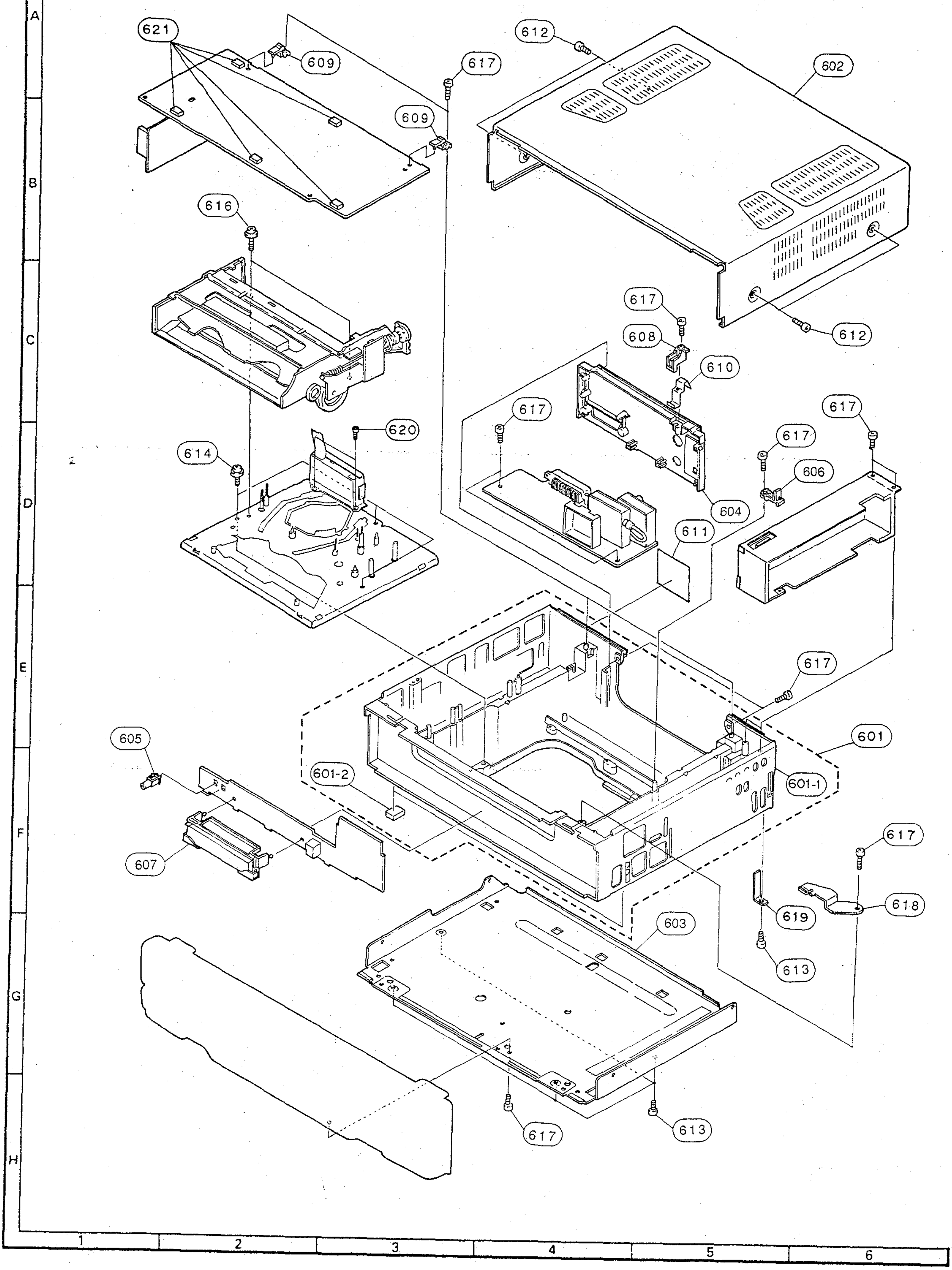
MECHANICAL PARTS
MECHANISCHE TEILE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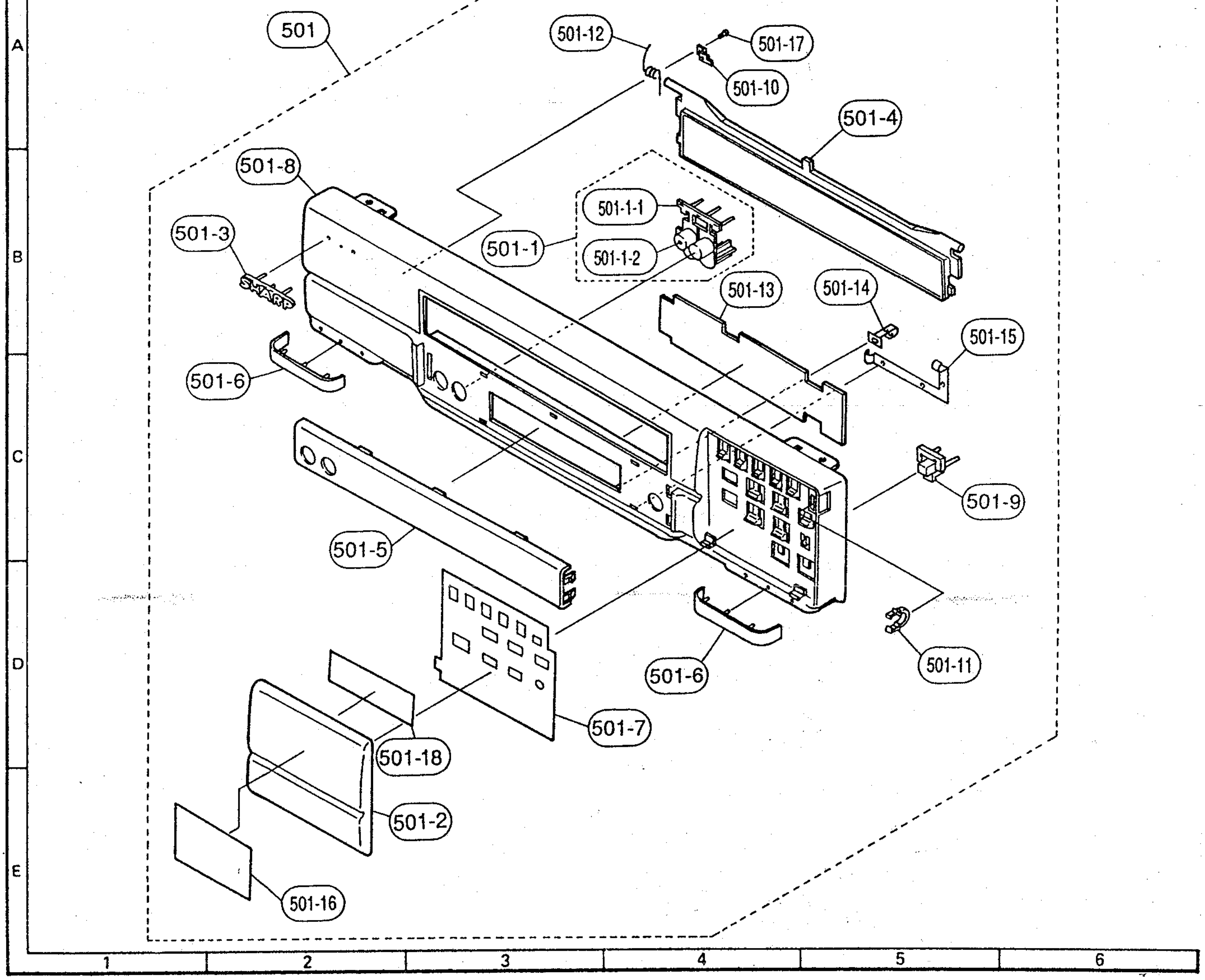
FRONT PANEL PARTS
FRONTTEILE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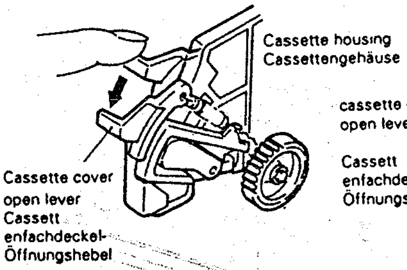
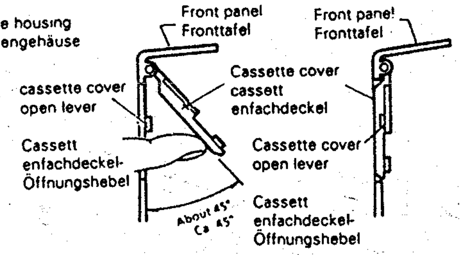
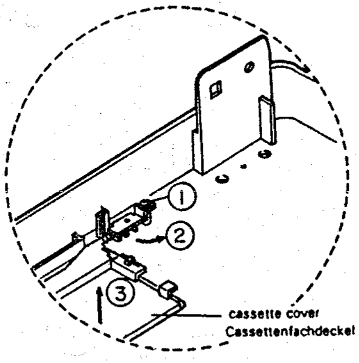
PRECAUTIONS ON FRONT PANEL SET-UP
VORSICHTSMASSNAHMEN BEIM ANBRINGEN DER FRONTTAFEL


Cassette housing
Cassettengehäuse
Cassette cover open lever
Cassett enfachdeckel-Öffnungshebel


Front panel
Fronttafel
Front panel
Fronttafel
cassette cover open lever
Cassett enfachdeckel-Öffnungshebel
Cassette cover
cassett enfachdeckel
Cassette cover open lever
Cassett enfachdeckel-Öffnungshebel
About 45°
Ca 45°


①
②
③
cassette cover
Cassettenfachdeckel

Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.

keep the cassette cover about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.

Vor dem Anringen der Fronttafel sicherstellen, daß sich der Cassettenfachdeckel-Öffnungshebel richting (tiefste stelle) befindet. Wenn sich der Hebel nicht in dieser Position befindet, ihn mit einem Finger hinunterdrücken.

Den Cassettenfachdeckel ca. 45° offen halten und sicherstellen, daß sich der Öffnungshebel zwischen der Fronttafel und dem Cassettenfachdeckel befindet. schließlich die Fronttafel befestigen.

Die Fronttafel nicht anbringen, wenn der cassettenfachdeckel zu weit geöffnet ist. Der Cassettenfachdeckel könnte durch das Cassettengehäuse beschädigt werden.

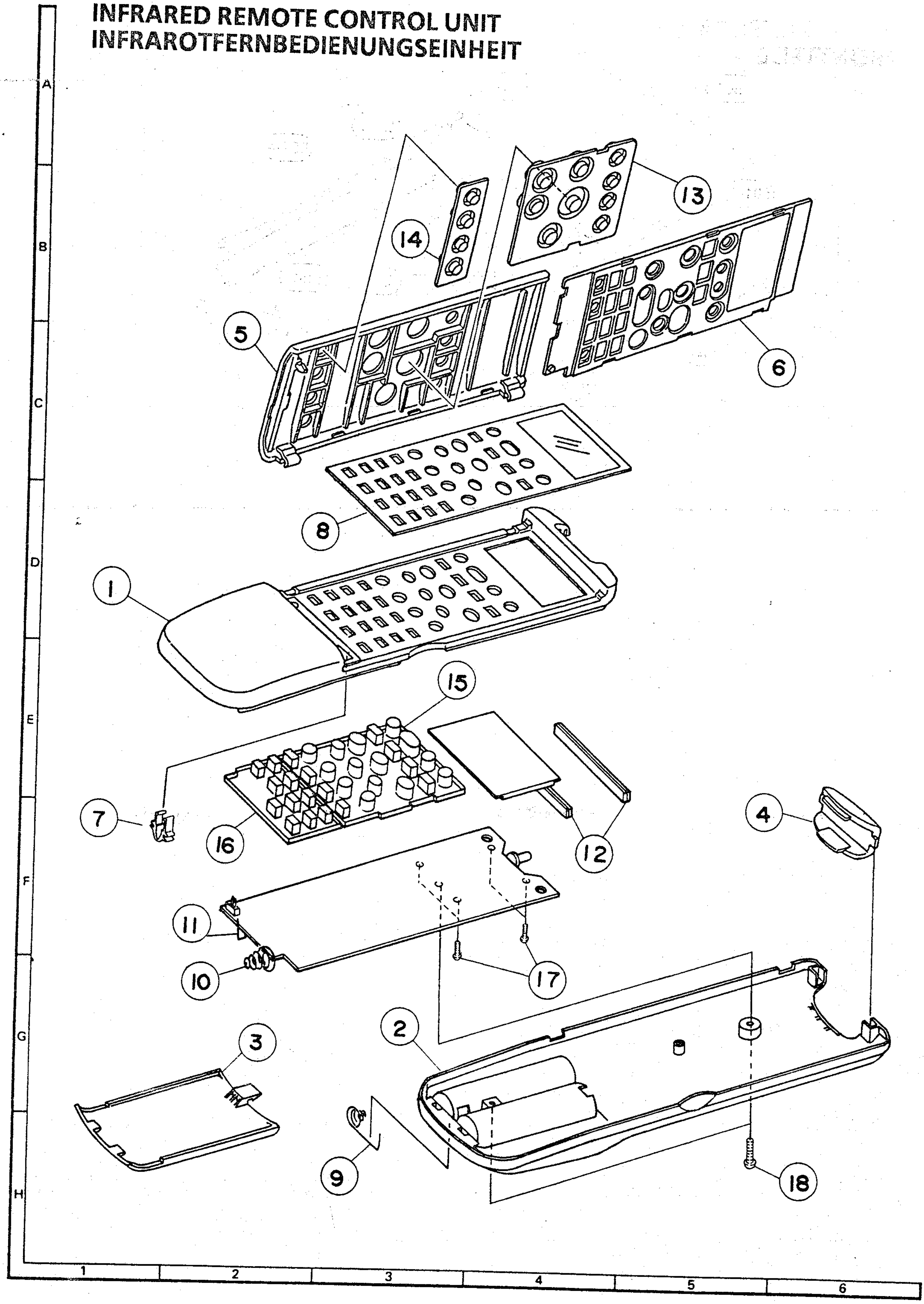
Removing the cassette compartment cover.

1. **Loosen the screw①and turn the fixing metal in the direction of the arrow②**
2. Lift up the cassette compartment cover in the direction of arrow③and remove it from the front panel.

Entfernen des Cassetten fachdeckels

1. **Die schraube①lösen und das Befestigungsstück in die Pfeilrichtung②drehen.**
2. Den Cassettenfachdeckel in die Pfeilrichtung③ anheben und den Deckel von der Frontplatte entfernen.

INFRARED REMOTE CONTROL UNIT
INFRAROTFERNBEDIENUNGSEINHEIT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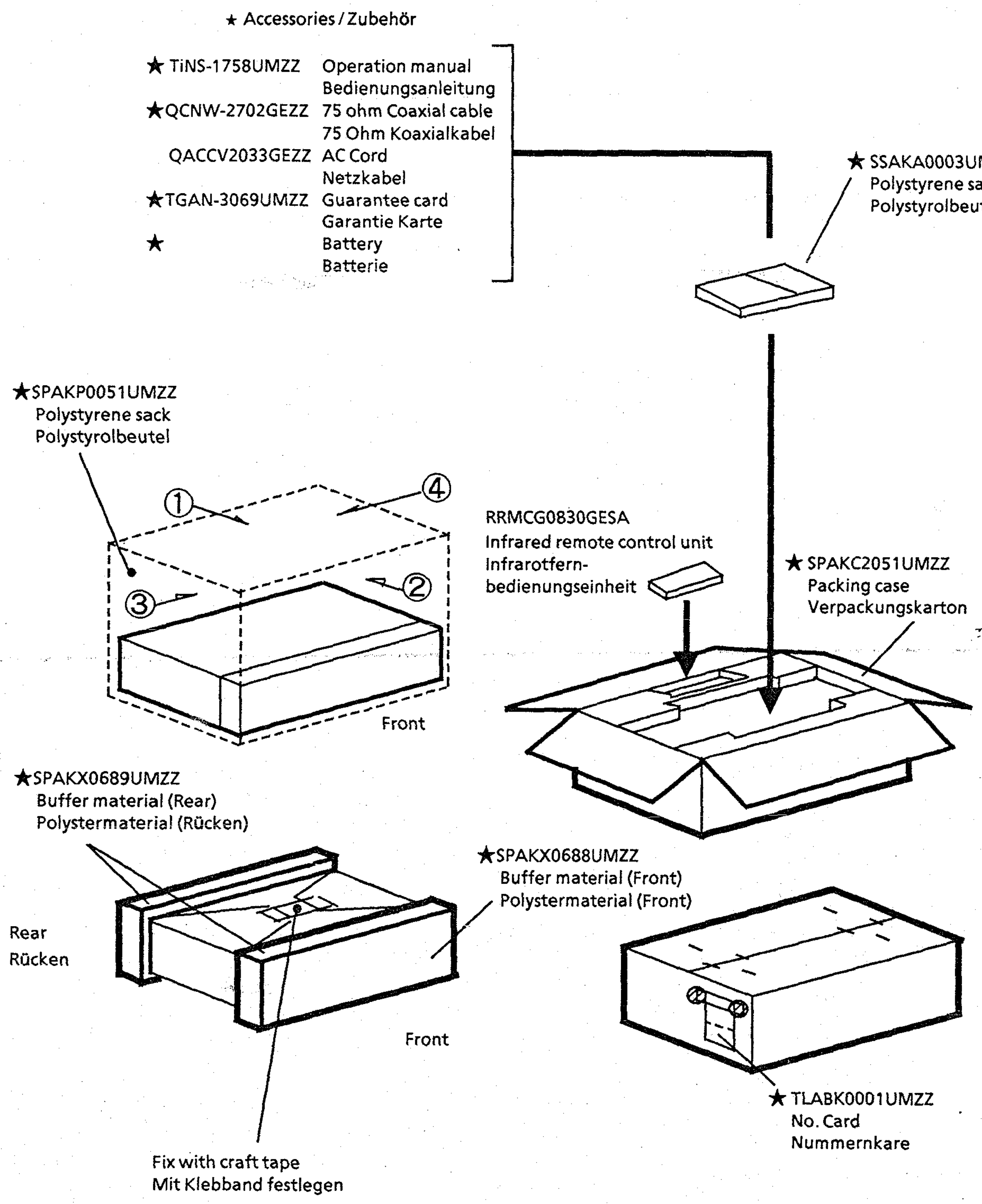
PACKING OF THE SET / VERPACKUNG DES GERÄTES

- **Setting position of the Knobs**
- **Einstellpositionen der Knöpfe**

Auto picture	at "ON" position	Automatischen Bild	Stellung "ON"
Test signal	at "OFF" Position	Prüfsignal	Stellung OFF (AUS)



★ Accessories / Zubehör

★ TiNS-1758UMZZ	Operation manual Bedienungsanleitung
★QCNW-2702GEZZ	75 ohm Coaxial cable 75 Ohm Koaxialkabel
QACCV2033GEZZ	AC Cord Netzkabel
★TGAN-3069UMZZ	Guarantee card Garantie Karte
★	Battery Batterie

★ SSAKA0003UMZZ
Polystyrene sack
Polystyrolbeutel

★SPAKP0051UMZZ
Polystyrene sack
Polystyrolbeutel

RRMCG0830GESA
Infrared remote control unit
Infrarotfern-bedienungseinheit

★ SPAKC2051UMZZ
Packing case
Verpackungskarton

★SPAKX0689UMZZ
Buffer material (Rear)
Polystermaterial (Rücken)

★SPAKX0688UMZZ
Buffer material (Front)
Polystermaterial (Front)

★ TLABK0001UMZZ
No. Card
Nummernkare

Fix with craft tape
Mit Klebband festlegen

★ Not Replacement Items
Keine Ersatzteile

SHARP

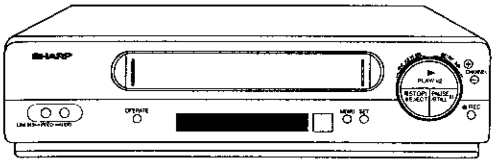
T8160-S
Printed in Japan
In Japan gedrukt

RECEIVED 2 8 APR 1995

SHARP SERVICE MANUAL

S74W9VC-A72HM

VHS VIDEO CASSETTE RECORDER



MODELS VC-A72HM VC-A72LM

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

CONTENTS

Page
1. SPECIFICATIONS 3
2. DISASSEMBLY AND REASSEMBLY 4
3. FUNCTION OF MAJOR MECHANICAL PARTS 7
4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS 9
5. ELECTRICAL ADJUSTMENT 36
6. MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE . 43
7. TROUBLESHOOTING 49
8. BLOCK DIAGRAMS 67
9. CIRCUIT DIARAM AND PWB FOIL PATTERN 77
10. REPLACEMENT PARTS LIST 90
11. EXPLODED VIEWS 102
12. PACKING OF THE SET 106

SHARP CORPORATION

PRECAUTIONS IN PART REPLACEMENT

When servicing the unit with power on, be careful to the section marked white all over.
This is the primary power circuit which is live.
When checking the soldering side in the tape travel mode, make sure first that the tape has been loaded and then turn over the PWB with due care to the primary power circuit.
Make readjustment, if needed after replacement of part, with the mechanism and its PWB in position in the main frame.

(1) Start and end sensors: Q851 and Q852.

Insert the sensor's projection deep into the upper hole of the holder (LHLDZ1893AJ00). Referring to the PWB, fix the sensors tight enough.

(2) Photocoupler RH-FX0005GEZZ: IC901

Refer to the symbol on the PWB and the anode marking of the part.

(3) Cam switches A and B (RH-PX0231GEZZ) : D854 and D855.

Adjust the notch of the part to the white marker of the symbol on the PWB. Do not allow any looseness.

(4) Take-up and supply sensors (RH-PX0232GEZZ): D857 and D856.

Be careful not to confuse the setting direction of the parts in reference to the symbols on the PWB. Do not allow any looseness.

(5) Diode bridge (RH-DX0083GEZZ):D901.

Adjust the + marking of the part to the symbol's cathode marking on the PWB.

1. SPECIFICATIONS

Format:	VHS PAL standard
Video recording system:	Two rotary heads, helical scan system
Video signal:	PAL colour and B/G signals, 625 lines
Recording/playing time:	260 min max. with SHARP E-260 tape (SP) 520 min max. with SHARP E-260 tape (LP)
Tape width:	12.7 mm
Tape speed:	23.39 mm/s (SP) 11.70 mm/s (LP)
Antenna:	75 ohm unbalanced
Receiving channel:	VHF Channel B-J (VC-A72LM) UHF Channel E21-E69
RF converter output signal:	UHF Channel E30-E39 (preset to CH E36)
Power requirement:	AC240V, 50Hz (VC-A72HM) AC220V, 50Hz (VC-A72LM)
Power consumption:	Approx. 18 W
Operating temperature:	5°C to 40°C
Storage temperature:	– 20°C to 60°C
Weight:	Approx. 3.8 kg
Dimensions:	380 mm (W) × 290.5 mm (D) × 93 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	45 dB (SP)
Horizontal resolution:	250 lines (SP)
AUDIO	0 dBs = 0.775 Vrms
Input:	Line: – 3.8 dB, 47k ohm
Output:	Line: – 3.8 dB, 1k ohm
S/N ratio:	42 dB
Frequency responce:	80 Hz ~ 10 kHz
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery (2pcs.) Quick set-up guide card (VC-A72HM) Resistration Card (VC-A72HM)

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

BEFORE RETURNING THE VIDEO CASSETTE RECORDER

In addition to the checks necessary as a result of a repair having been carried out, the following additional safety checks should also be made before returning the unit to the user.

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the Video cassette recorder.

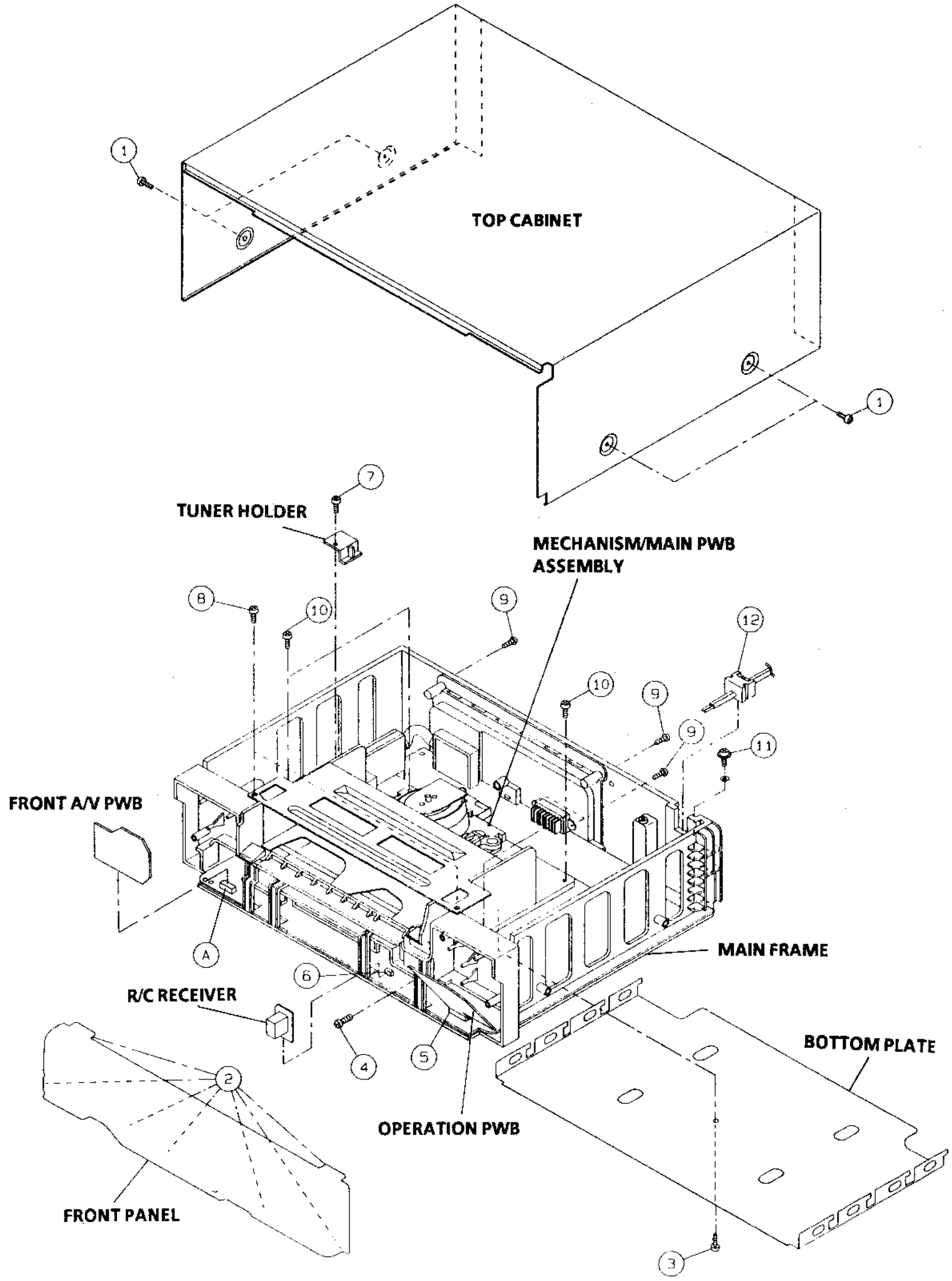
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators etc.

3. Apply test voltage of 3000 volts between live parts and accessible metal parts for 3 seconds.

2. DISASSEMBLY AND REASSEMBLY

2-1 DISASSEMBLY OF MAJOR BLOCKS

TOP CABINET : Remove 4 screws ①.
FRONT PANEL : Remove 7 clips ②.
BOTTOM PLATE : Remove 1 screw ③.
OPERATION PWB : Remove 1 screw ④. Tilt the PWB by 45° and take it out of the socket ⑤.
FRONT A/V PWB : Take it out of the socket Ⓐ.
R/C RECEIVER : Take it out of the socket ⑥.
TUNER HOLDER : Remove 1 screw ⑦.
MECHANISM/ MAIN PWB ASSEMBLY : Remove 2 screws ⑧, 2 screws ⑨, 4 screws ⑩, 1 screw ⑪ and 1 gromment ⑫ . Lift the rear end of the mechanism/main PWB assembly and take it out of the main frame.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TOP CABINET
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TUNER HOLDER
MECHANISM/MAIN PWB ASSEMBLY
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FRONT A/V PWB
A
MAIN FRAME
6
R/C RECEIVER
4
5
BOTTOM PLATE
2
OPERATION PWB
FRONT PANEL
3

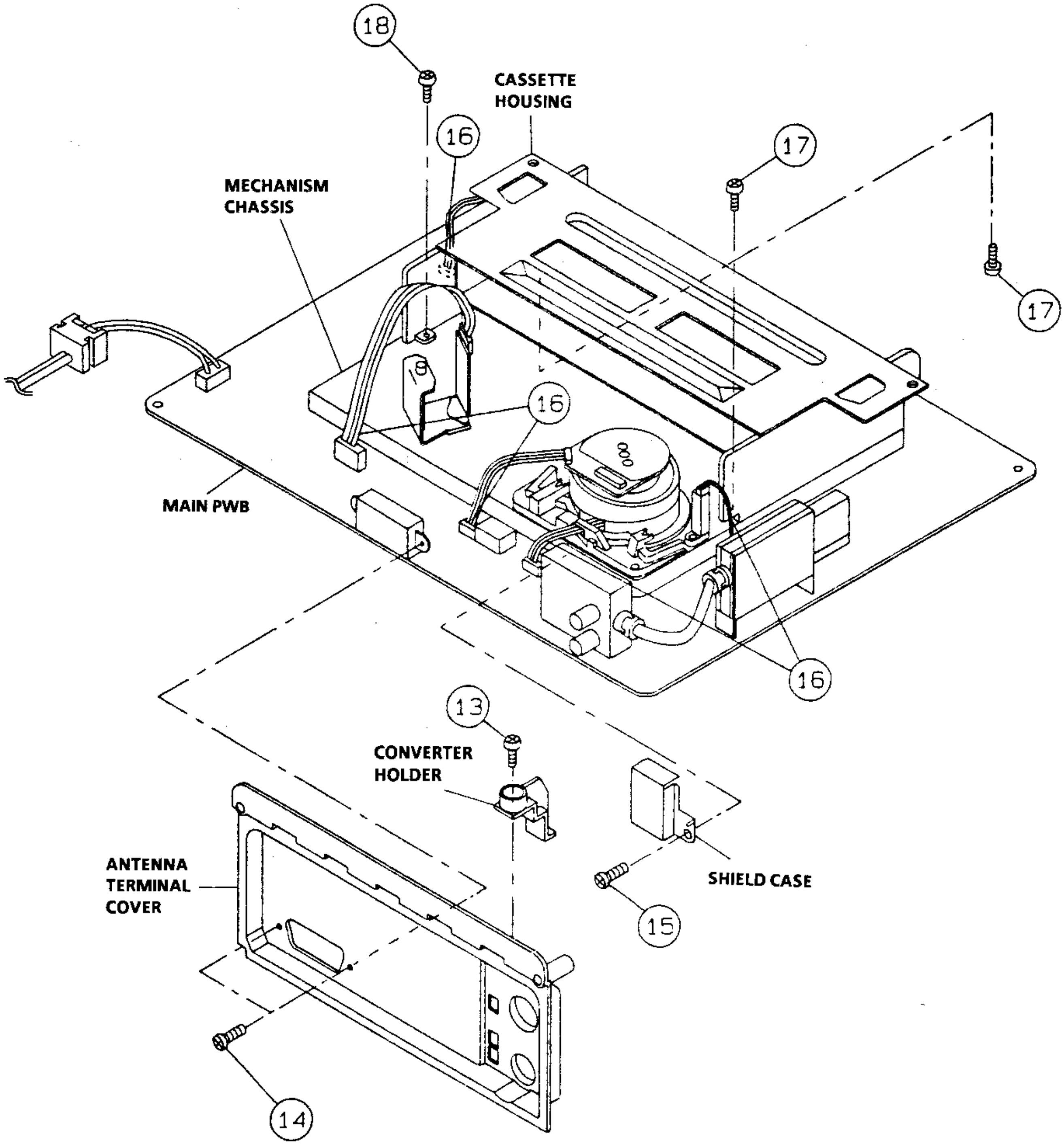
2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

CONVERTER HOLDER : Remove 1 screw ⑬.

ANTENNA TERMINAL COVER : Remove 2 screws ⑭.

MECHANISM CHASSIS/ CASSETTE HOUSING ASSEMBLY : Remove 1 screw ⑮ and shield case.
Remove 3 FFCs and 2 harnesses ⑯.
Be carefull not to confuse the top and bottom of the FFC.
Remove 1 screw ⑰.
Remove the mechanism assembly straight up from the main PWB with care not to damage their surrounding parts.

CASSETTE HOUSING : Remove 2 screws ⑱.


18
CASSETTE HOUSING
16
17
MECHANISM CHASSIS
17
16
MAIN PWB
16
13
CONVERTER HOLDER
ANTENNA TERMINAL COVER
SHIELD CASE
15
14

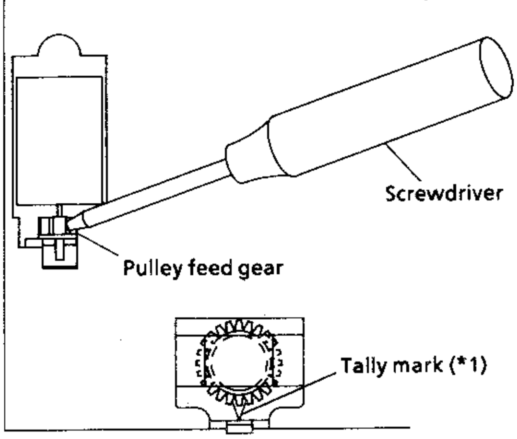
2-3 PRECAUTIONS IN REASSEMBLING

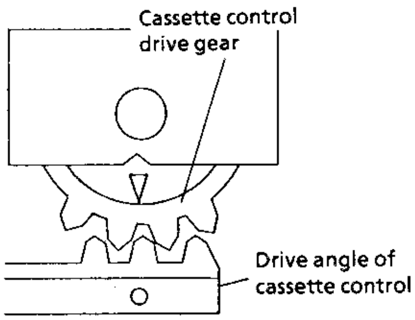
MOUNTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

Electrical setting:

Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor, and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is used when the mechanism has been already set on its PWB.)





Phase matching point

Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

COUPLING THE MECHANISM TO THE PWB

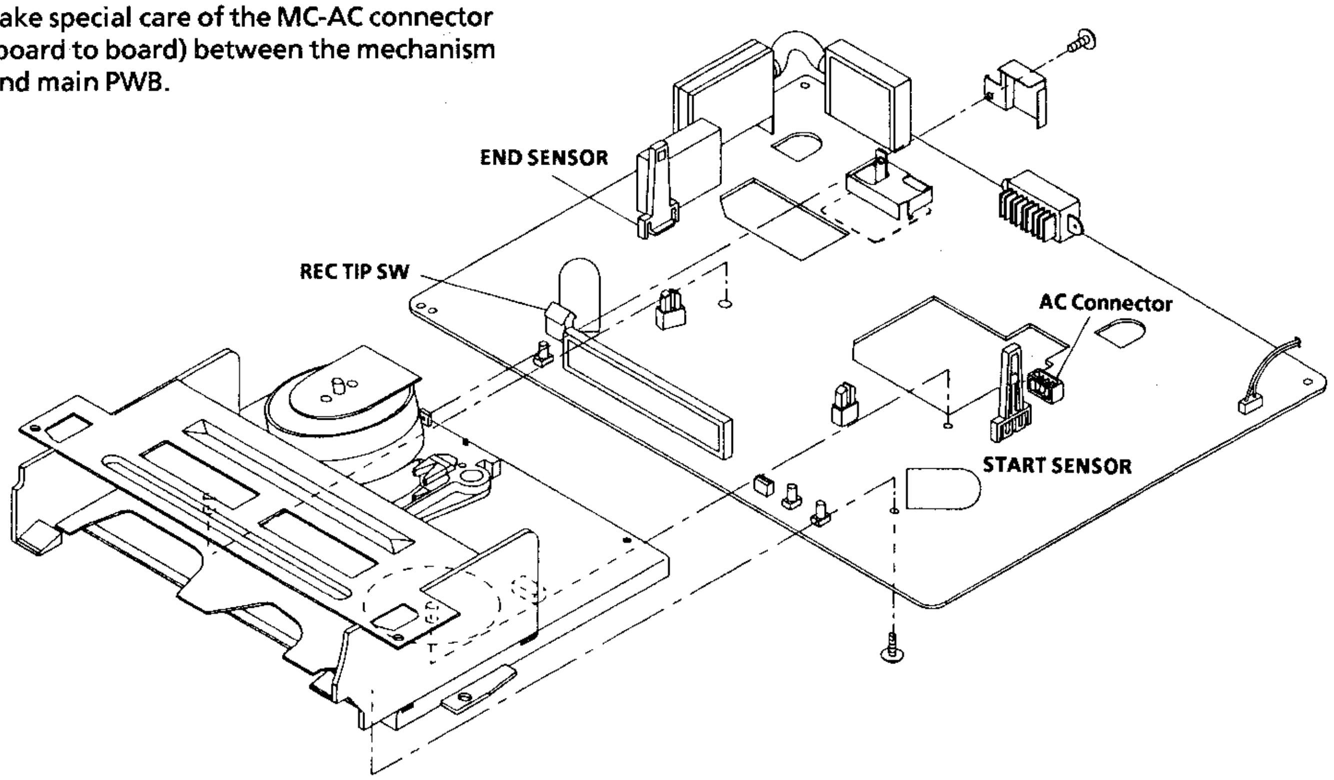
Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AA, AD and AH) and harnesses (AE and AL) between the mechanism and main PWB.

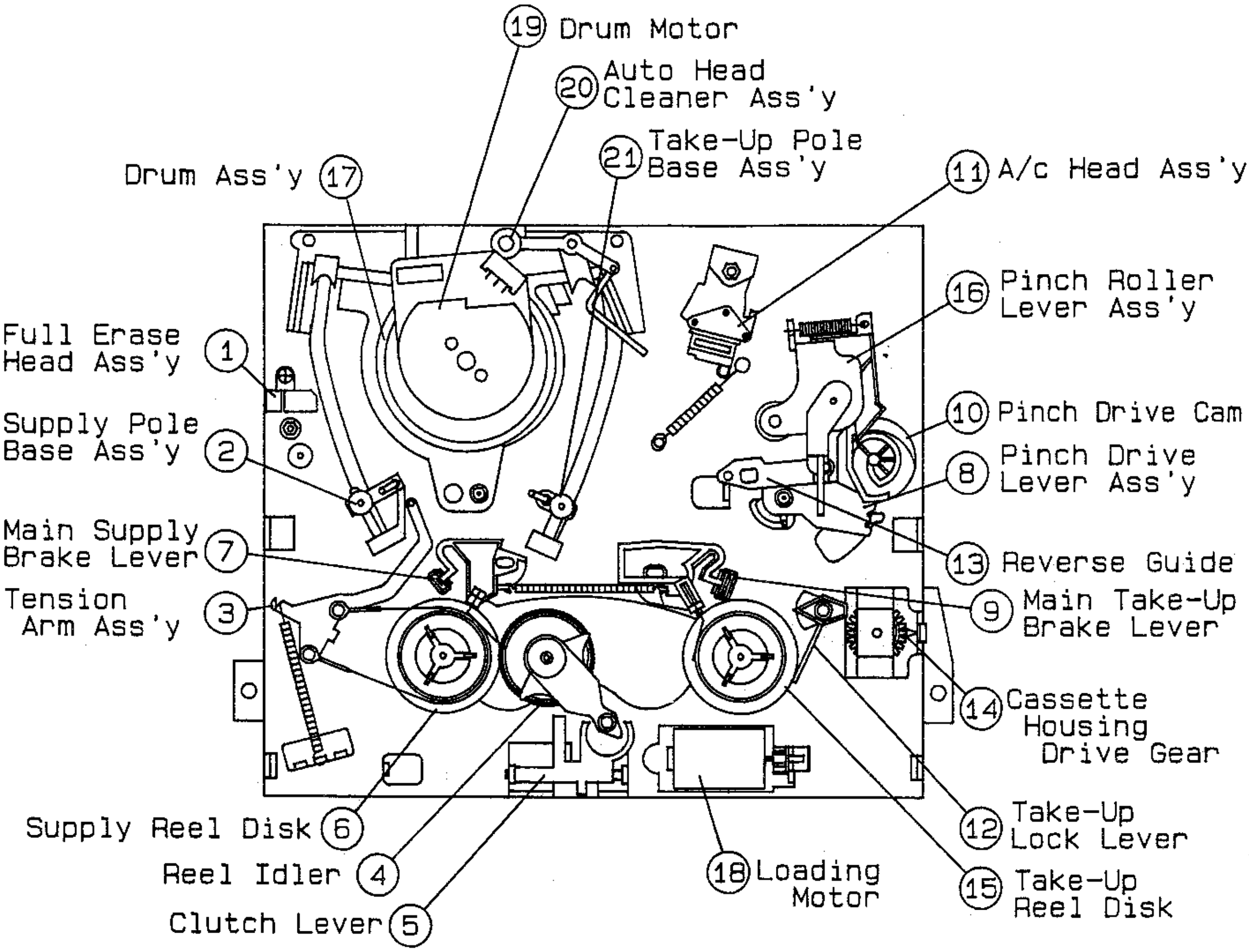
Parts to pay attention to:

Start and end sensors	Q851, Q852
Record tip switch	S851

Take special care of the MC-AC connector (board to board) between the mechanism and main PWB.

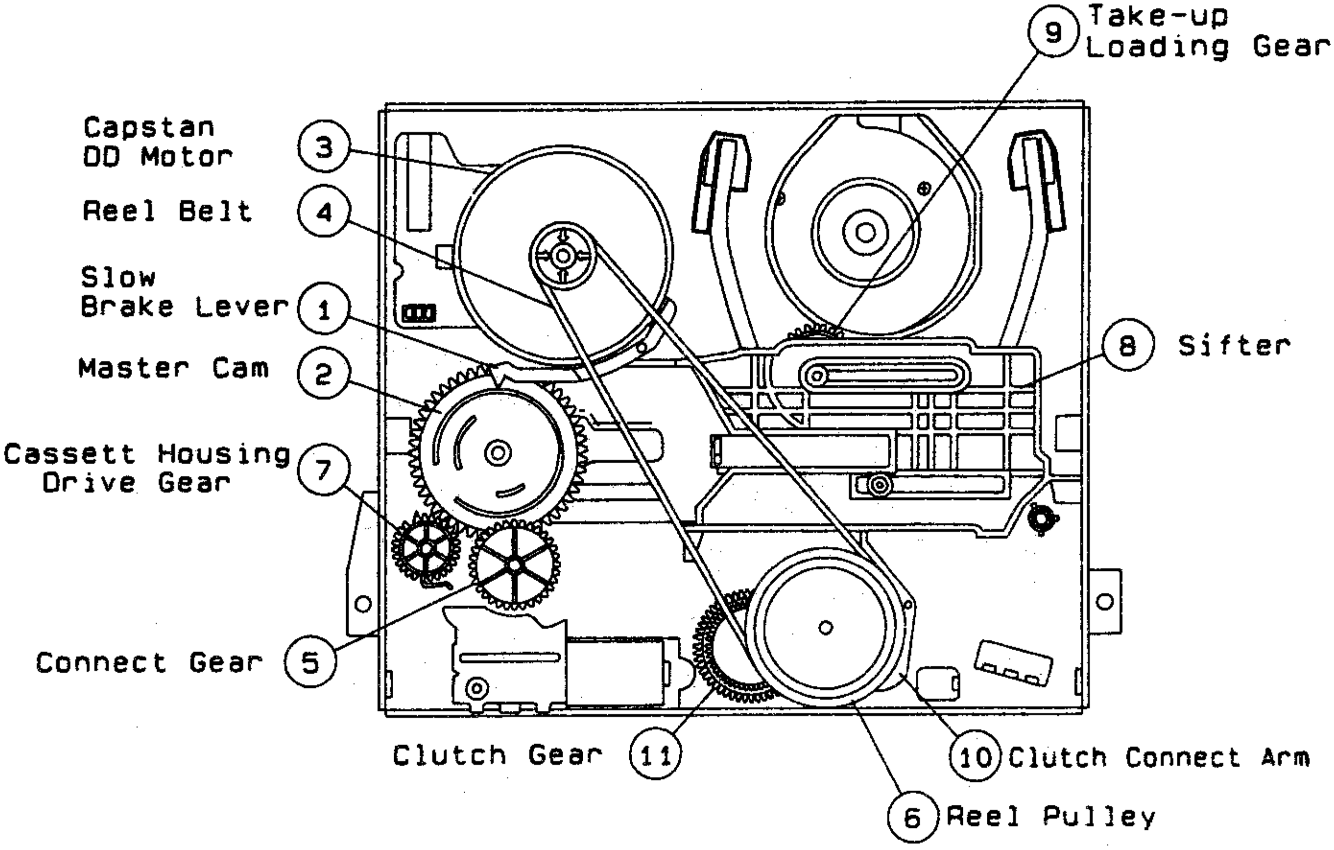


3. FUNCTION OF MAJOR MECHANICAL PARTS (TOP VIEW)


⑲ Drum Motor
⑳ Auto Head Cleaner Ass'y
㉑ Take-Up Pole Base Ass'y
Drum Ass'y ⑰
⑪ A/c Head Ass'y
⑯ Pinch Roller Lever Ass'y
Full Erase Head Ass'y ①
⑩ Pinch Drive Cam
Supply Pole Base Ass'y ②
⑧ Pinch Drive Lever Ass'y
Main Supply Brake Lever ⑦
⑬ Reverse Guide
Tension Arm Ass'y ③
⑨ Main Take-Up Brake Lever
⑭ Cassette Housing Drive Gear
Supply Reel Disk ⑥
⑫ Take-Up Lock Lever
Reel Idler ④
⑱ Loading Motor
⑮ Take-Up Reel Disk
Clutch Lever ⑤

No.	Function	No.	Function
1.	Full erase head ass'y Erase the whole records on the tape in the recording mode.	13.	Reverse guide Pulls out the tape and controls the tape drive train height with the upper and lower guides.
3.	Tension arm ass'y Detects the tension of tape while running, and brakes the supply reel disk via the tension band.	16.	Pinch roller lever ass'y Press-fits the tape to the capstan during tape running. The right protrusion switches the clutch of the cassette housing control assembly in "tape eject", and makes the mechanism eject the tape.
7.	Main supply brake lever Brakes the supply reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.	18.	Loading motor A motive power which drives the mechanism. It transmits the power to the master cam and cassette housing control assembly.
9.	Main take-up brake lever Brakes the take-up reel disk to prevent tape slackening when the unit is stopped in fast forward or rewind mode.		

FUNCTION OF MAJOR MECHANICAL PARTS (BOTTOM VIEW)


⑨ Take-up Loading Gear
Capstan DD Motor ③
Reel Belt ④
Slow Brake Lever ①
Master Cam ②
⑧ Sifter
Cassett Housing Drive Gear ⑦
Connect Gear ⑤
Clutch Gear ⑪
⑩ Clutch Connect Arm
⑥ Reel Pulley

No.	Function	No.	Function
1.	Slow brake lever Gets in contact with the capstan D.D. motor linking to the master cam in the slow still mode, and brakes it to a certain degree.	6.	Reel pulley Transmits the power of the capstan D.D. motor to the reel disk via the reel idler.
3.	Capstan D.D. motor A motive power which runs the tape. It transmits the power via the reel belt.	8.	Shifter Transmits the operation of the master cam to break and loading gear.
4.	Reel belt Transmits the power to run the tape to the reel pulley.	9.	Take-up loading gear Shifts the take-up pole base and guide roller via the loading relay gear, and applies the tape around the drum assembly, as well as transmits the power to the supply loading gear.

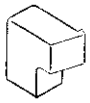
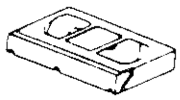
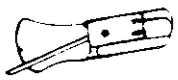
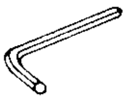
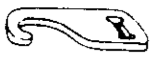
4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

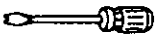
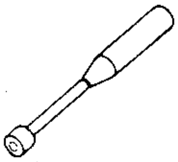
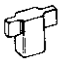
Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.
2	Master Plane Jig	JiGMP0001	BY		
3	A/C Head Tilt Adjusting Jig	JiGACH-A323U	BX		This Jig is used for setting the A/C head tilt.
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.
	Torque Gauge (1.2 kg)	JiGTG1200	CN		
5	Gauge Head	JiGTH0006	AW		
6	Cassette Torque Meter	JiGVHT-063	CZ		This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.
7	Tension Gauge (300g)	JiGSG0300	BF		There are two gauges used for the tension measurements, 300 g and 2.0 kg.
	Tension Gauge (2.0kg)	JiGSG2000	BS		
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.
	Hex Wrench (1.2mm)	JiGHW0012	AE		
	Hex Wrench (1.5mm)	JiGHW0015	AE		
9	Alignment Tape (PAL)	VR0CPSV	CK		This tape is especially used for electrical fine adjustment.
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.

No.	Jig Item	Part No.	Code	Configuration	Remarks
12	Special Bladed Screwdriver	JiGDRiVERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resin-made parts: the specified torque is 5 kg.
14	Box Driver	JiGDRiVER110-7	AS		This Jig is used for height adjustment of the A/C head and X-position.
		JiGDRiVER110-4	AV		This Jig is used for replacement of the SI roller.
17	Reverse Guide Height Adjusting Jig	JIGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Maintained Parts	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	☐	☐	☐	○	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller	☐	☐	☐	○		
Supply impedance roller (inner hole and shaft)		☐		☐		Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange	☐	☐	☐	☐		Clean tape contact part with the specified cleaning liquid.
Retaining guide	☐	☐	☐	☐		
Slant pole	☐	☐	☐	○		
Video head (upper drum ass'y)	☐	○ ☐	☐	○ ☐	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head	☐	☐	☐	○	Poor colour, beating	
A/C head	☐	☐	☐	○	Sound too small or distorted	
Lower drum ass'y	☐	☐	☐	○	Poor flatness of the envelope with alignment tape	
Capstan D.D. Motor	☐	☐	☐	○	No tape running, uneven colour	
Pinch roller	☐	☐	☐	○	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		☐		○	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y				○	Cassette not loaded or unloaded	
Loading Motor				○		
Reel idler ass'y				○	No tape running	
Reel pully ass'y		☐ △		☐ ○		
Clutch gear ass'y				○		
Main supply/take-up brake levers				○	Tape slack	
AHC (Automatic Head Cleaner)		○		○		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

NOTE:
○: Part replacement.
☐: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

- **Removal**

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
   a) Remove the cassette housing installation screws ① and ②.
   b) Slide and pull out the cassette housing control assembly upward.

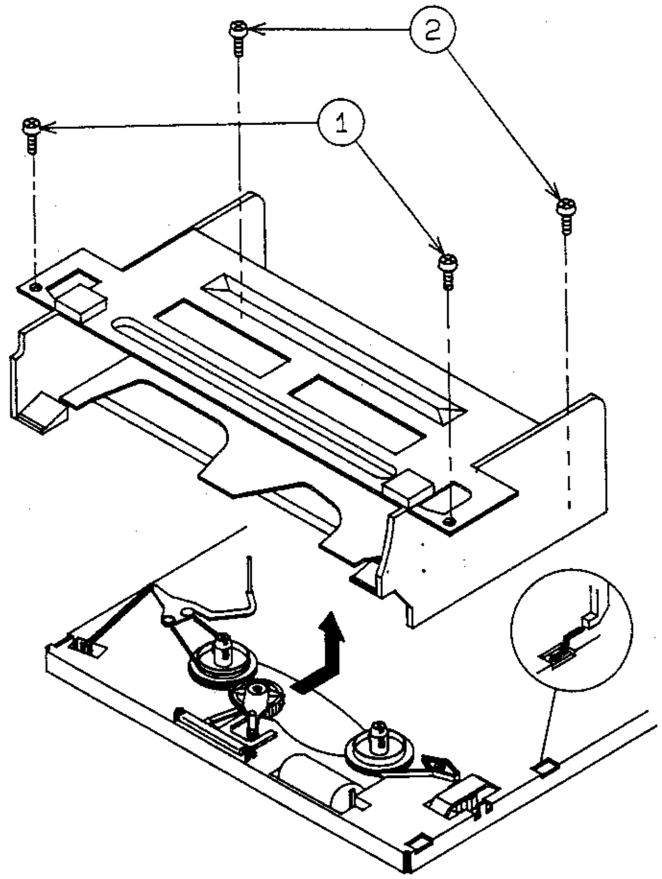


Figure 4-1.

- **Reassembly**

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Plug in the power cord. The cassette control drive gear starts and stops just when a tally mark appears in the mechanism chassis window. Align this tally mark with the cassette control drive angle's mark, as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.

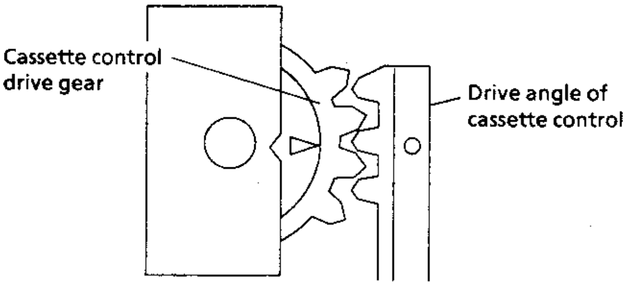


Figure 4-2.

2. Follow the procedures for removal in the reverse order.

Notes:

① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.

② In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.

③ Load the cassette once onto the cassette housing control assembly after reassembly.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor, before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism chassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

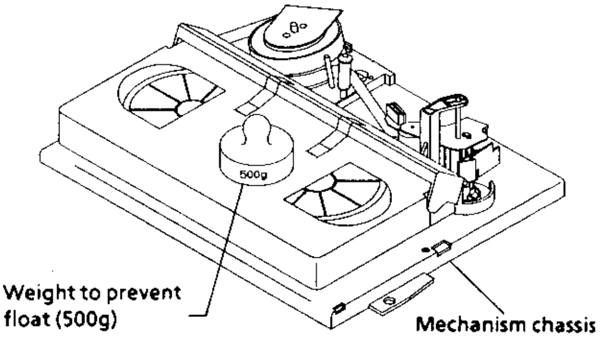


Figure 4-3.

Note:

The weight should not be more than 500g.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

- **Removal**

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
   a) Remove the cassette housing installation screws ① and ②.
   b) Slide and pull out the cassette housing control assembly upward.

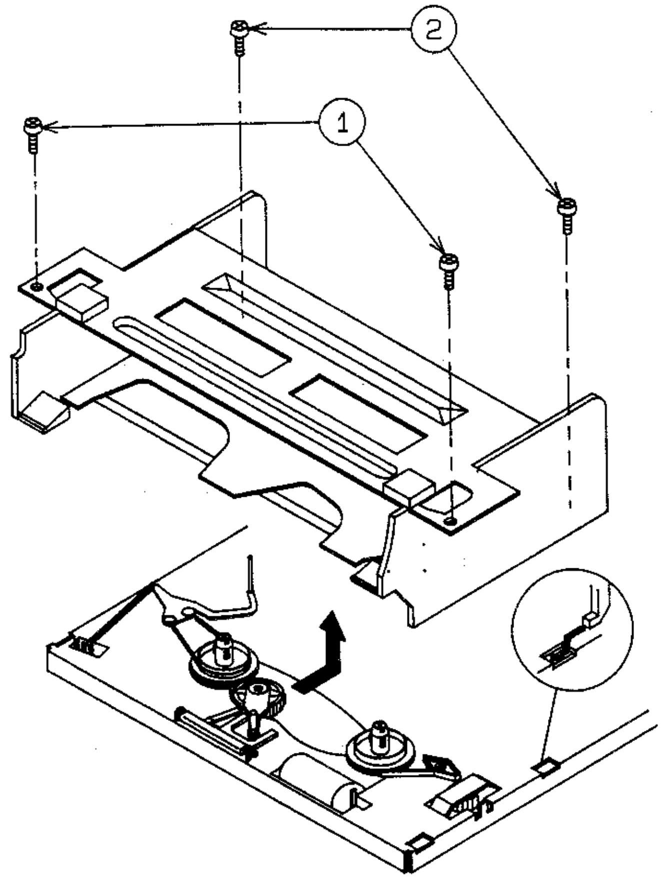


Figure 4-1.

- **Reassembly**

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Plug in the power cord. The cassette control drive gear starts and stops just when a tally mark appears in the mechanism chassis window. Align this tally mark with the cassette control drive angle's mark, as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.

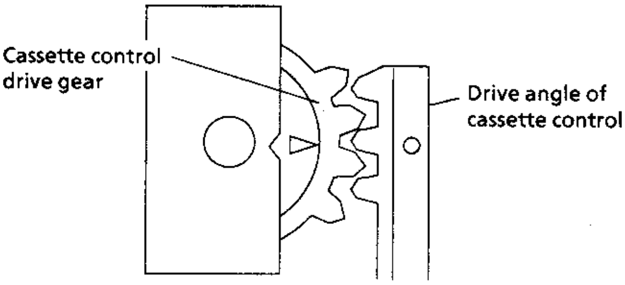


Figure 4-2.

2. Follow the procedures for removal in the reverse order.

Notes:

① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, or the drum.

② In removal and reassembly, take care not to hit the cassette housing control assembly or tools against the guide pin, drum, or the like thereabout.

③ Load the cassette once onto the cassette housing control assembly after reassembly.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor, before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism chassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

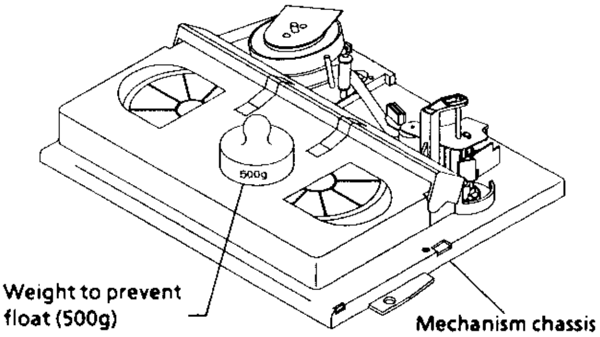


Figure 4-3.

Note:

The weight should not be more than 500g.

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Maintained Parts	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y	□	□	□	○	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Supply impedance roller	□	□	□	○		
Supply impedance roller (inner hole and shaft)		□		□		Clean with pure high quality isopropyl alcohol.
Supply impedance roller flange	□	□	□	□		Clean tape contact part with the specified cleaning liquid.
Retaining guide	□	□	□	□		
Slant pole	□	□	□	○		
Video head (upper drum ass'y)	□	○□	□	○□	Poor S/N ratio, no colour	Clean tape contact area with the specified cleaning liquid.
Full-erase head	□	□	□	○	Poor colour, beating	
A/C head	□	□	□	○	Sound too small or distorted	
Lower drum ass'y	□	□	□	○	Poor flatness of the envelope with alignment tape	
Capstan D.D. Motor	□	□	□	○	No tape running, uneven colour	
Pinch roller	□	□	□	○	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Reel belt		□		○	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y				○	Cassette not loaded or unloaded	
Loading Motor				○		
Reel idler ass'y				○	No tape running	
Reel pully ass'y		□△		□○		
Clutch gear ass'y				○		
Main supply/take-up brake levers				○	Tape slack	
AHC (Automatic Head Cleaner)		○		○		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

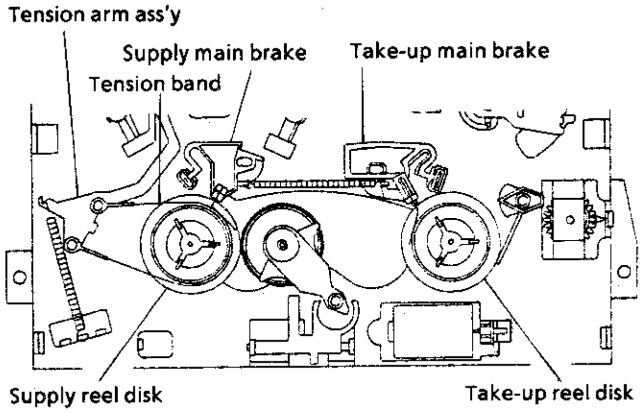
NOTE:
○: Part replacement.
□: Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
△: Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000 hrs).

If the reading is out of the specified value, clean or replace the part.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

- **Removal (Supply and Take-up reel disks)**

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Remove the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.


Tension arm ass'y
Supply main brake
Take-up main brake
Tension band
Supply reel disk
Take-up reel disk

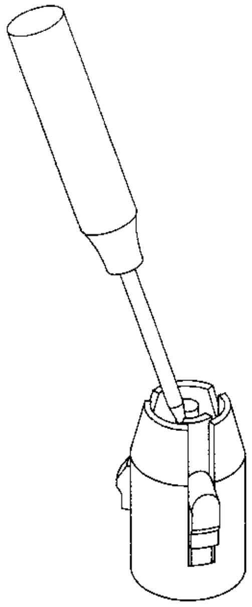


Figure 4-4.

Note:
When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

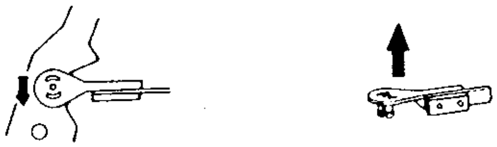


Figure 4-5.

- **Reassembly (Supply reel disk)**

1. Clean the reel disk shaft and apply oil to it.
2. Install a new supply reel disk onto the shaft.
3. Replace the tension band around the supply reel disk, and insert it to the hole of the tension arm.
4. Check the reel disk height and reassemble the supply main brake.

Notes:
① Take enough care not to deform the tension band during installation of the supply reel disk.
② Be careful not to damage the supply main brake.

- **Reassembly (Take-up reel disk)**

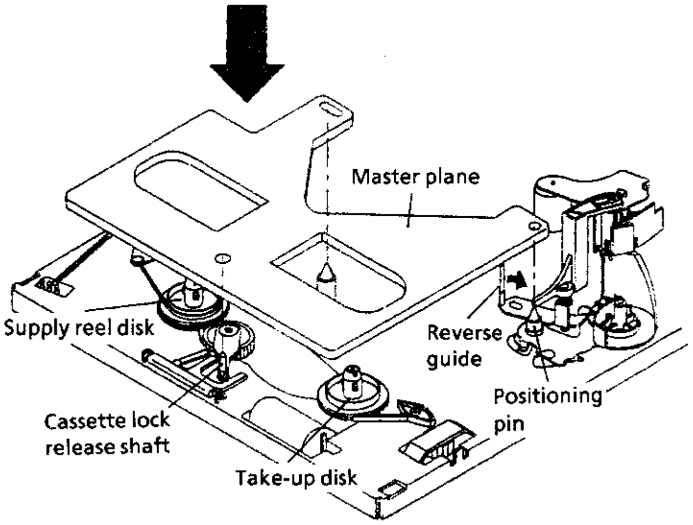
1. Clean the reel disk shaft and apply oil to it.
2. Install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

Note:
Take care not to damage the take-up main brake.

* After reassembly, check the video search rewind back tension (see page 16), and check the brake torque (see page19).

- **Height checking and adjustment**

Note:
Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).


Master plane
Supply reel disk
Reverse guide
Positioning pin
Cassette lock release shaft
Take-up disk

Set the master plane releasing the reverse guide by a finger.

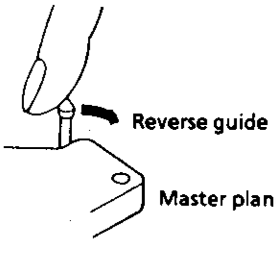

Reverse guide
Master plane

Figure 4-6.

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:
Whenever replacing the reel disk, perform the height checking and adjustment.

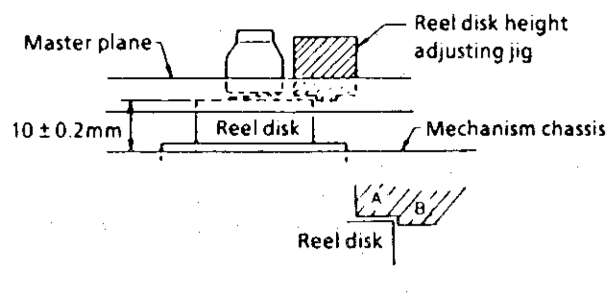

Master plane
Reel disk height adjusting jig
10 ± 0.2mm
Reel disk
Mechanism chassis
A
B
Reel disk

Figure 4-7.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button to set the mechanism to the fast forward mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

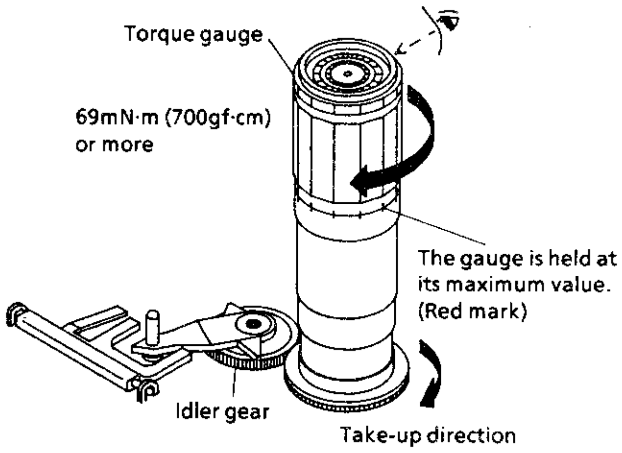

Torque gauge
69mN·m (700gf·cm) or more
The gauge is held at its maximum value. (Red mark)
Idler gear
Take-up direction

Figure 4-8.

- **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the REW button to set the mechanism to the rewind mode.

- **Checking**

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN·m (700 gf·cm).

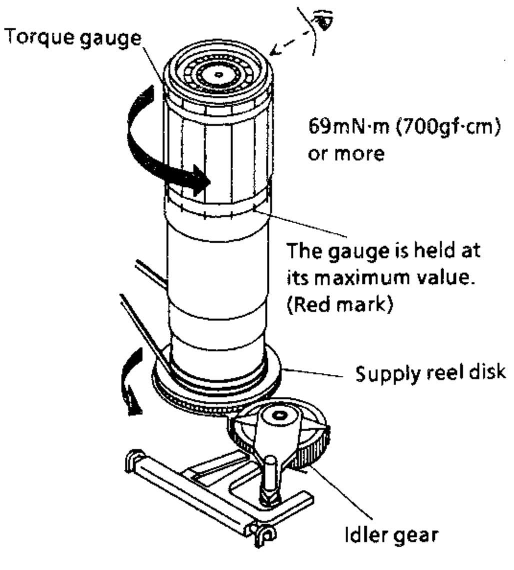

Torque gauge
69mN·m (700gf·cm) or more
The gauge is held at its maximum value. (Red mark)
Supply reel disk
Idler gear

Figure 4-9.

- **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, reel belt and reel pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the reel belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.
5. Put the weight (500g) on the cassette torque meter.
6. Press the REC button to put the unit in REC mode.

Set value SP 8.8 ± 3.8mN·m (90 ± 39gf·cm)

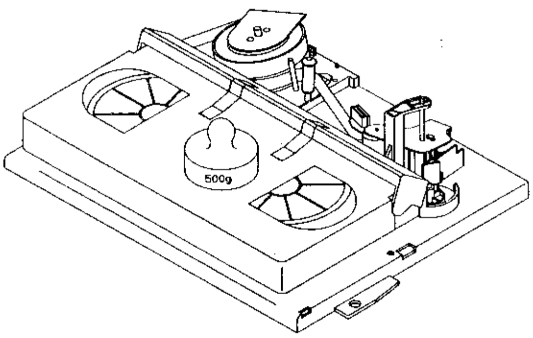


Figure 4-10.

- **Checking**

1. Check that the torque is in the range of 8.8 ± 3.8mN·m (90 ± 39gf·cm).
2. The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation as the value.
3. Place the ass'y in the SP record mode, and check that the take-up torque is within the range.

- **Adjustment**

If the take-up torque in the playback mode is outside the range, replace the reel pulley ass'y.

Note:

Stabilize the cassette torque meter to prevent floating.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the REW button to place the ass'y in the video search rewind mode.

- **Checking**

1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value 14.5 $^{+8}_{-6}$ mN·m (148 $^{+80}_{-60}$gf·cm)

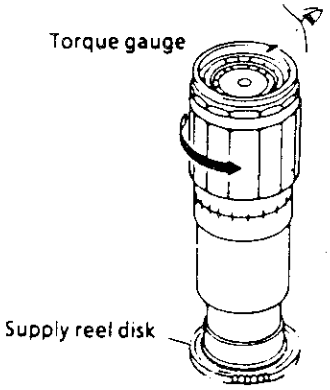


Figure 4-11.

Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

- **Adjustment**

If the take-up torque in video search rewind mode is outside the range, replace the reel pulley ass'y.

Note:

The torque fluctuates due to the rotational deviation of the reel pulley ass'y. Use the center of the fluctuation at the value.

CHECKING THE FAST FORWARD BACK TENSION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- Checking
  1. Push the FF button to place the ass'y in the fast forward mode.
  2. Place the torque gauge on the supply reel disk, and turn it clockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is 1.5 ± 0.9mN·m (15 ± 9gf·cm).

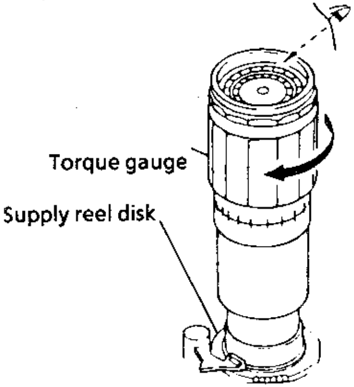


Figure 4-12.

Note:

① Set the torque gauge securely on the supply reel disk. If the torque gauge is not securely set on the reel disk, measurement will be incorrect.

② Measure the torque with the torque gauge's weight exerted on the reel disk.

CHECKING THE REWIND BACK TENSION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- Checking
  1. Push the REW buton to place Place the ass'y in the rewind mode.
  2. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is 1.3 ± 0.8 mN·m (13 ± 8gf·cm).

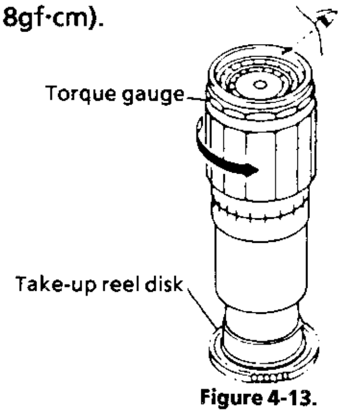


Figure 4-13.

Note:

① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

② Measure the torque with the torque gauge's weight exerted on the reel disk.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- Checking

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the rewind button to place the ass'y in the video search rewind mode.
3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value 4 ± 1.7mN·m (41 ± 17gf·cm).

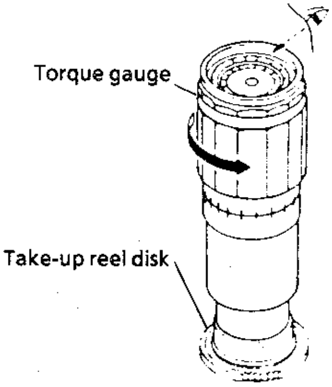


Figure 4-14.

Note:

① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.

② Measure the torque with the torque gauge's weight not exerted on the reel disk.

CHECKING THE PINCH ROLLER PRESSURE

- **Remove the cassette housing control assembly.**
- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- Checking
  Push the PLAY button to place the ass'y in the playback mode.

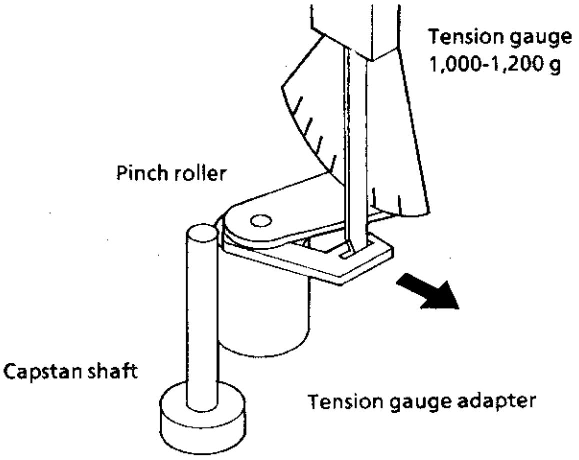

Tension gauge
1,000-1,200 g
Pinch roller
Capstan shaft
Tension gauge adapter

Figure 4-15.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- Setting

1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
2. Load the cassette tape into the unit.
3. Put the weight (500g) on the cassette tape.

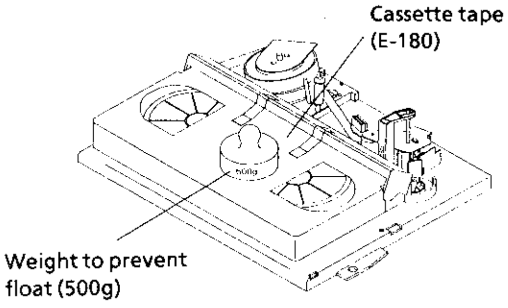

Cassette tape
(E-180)
Weight to prevent
float (500g)

Figure 4-16.

- Checking

1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.
2. Visually check to see if the left end of the tension pole is in alignment with the line 0.2 mm left of the center line of the SI roller. Readjust as required in the following steps.

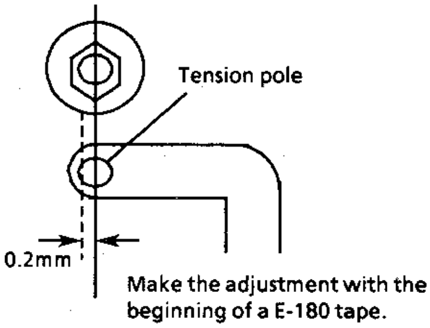

Tension pole
0.2mm
Make the adjustment with the beginning of a E-180 tape.

Figure 4-17.

① If the end is at the left from the dotted line:

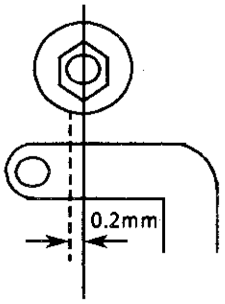


Figure 4-18.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam and turn it clockwise.
2. Place the cassette in position and check the tension pole position.

② If the end is at the right from the dotted line:

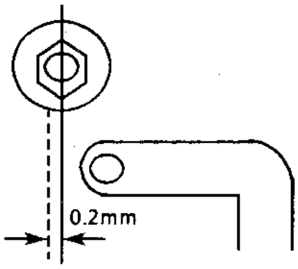


Figure 4-19.

1. Remove the cassette and press the REC button to make an empty loading. Put a bladed screwdriver into the tension band positioning cam to turn it counterclockwise.
2. Place the cassette in position and check the tension pole position.

Note:

① The tension band positioning cam cannot be adjusted with a cassette in place because the cam will be located below the cassette. Repeat a series of steps; empty loading, adjustment, cassette placement and position checking.

② Turn the positioning cam clockwise to move the tension pole to the right (in the black-arrow direction). Turn it counterclockwise to move the tension pole to the left (in the white-arrow direction).

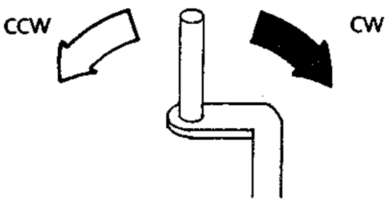


Figure 4-20.

③ Adjustable range of the tension pole positioning cam.

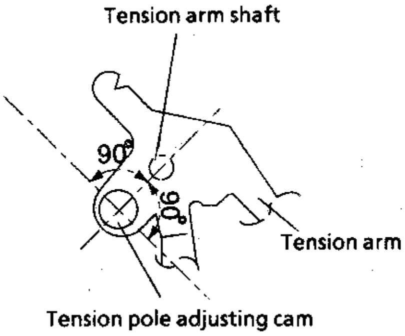


Figure 4-21.

Adjust the tension pole positioning cam so that the arrow mark on the cam be within 90° left and right from the tension arm shaft's center.

CHECKING AND ADJUSTMENT OF RECORD / PLAYBACK BACK TENSION

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**
- **Setting**

1. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
2. Load the cassette torque meter into the unit.
3. Put the weight (500g) on the cassette torque meter.

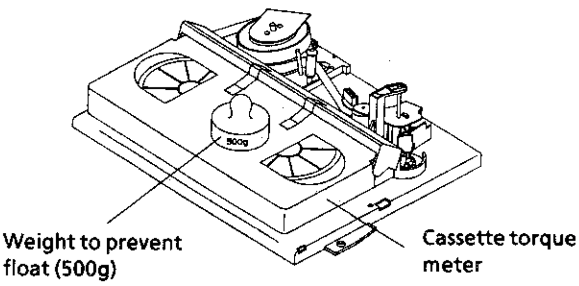


Figure 4-22.

- **Checking**

1. Push the REC button to place the unit in the record mode.
2. Check that the back tension indicated by the gauge is within the set range 31 to 38 g·cm.

Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

- **Adjustment**

1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

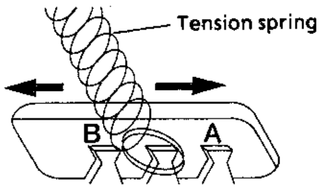
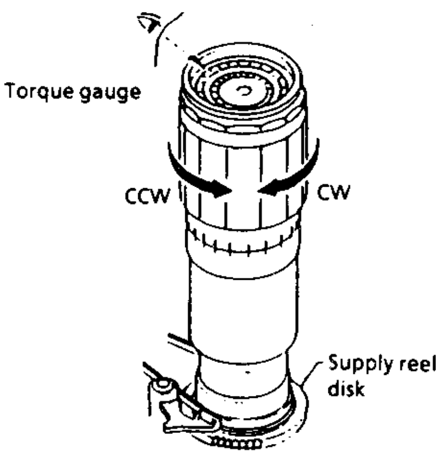


Figure 4-23.

CHECKING THE BRAKE TORQUE

- **Checking the brake torque at the supply side**



CCW: 10 ± 4mN·m (102 ± 41gf·cm)
CW: 35 ± 20mN·m (357 ± 204gf·cm)

Figure 4-24.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

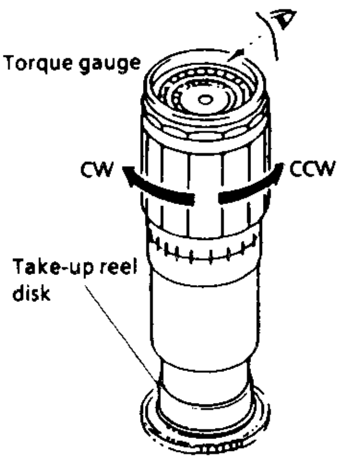
- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 35 ± 20mN·m (357 ± 204gf·cm), CCW direction = 10 ± 4mN·m (102 ± 41gf·cm), and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

- **Checking the brake torque at the take-up side**



CCW: 35 ± 20mN·m (357 ± 204gf·cm)
CW: 10 ± 4mN·m (102 ± 41gf·cm)

Figure 4-25.

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.**

- **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

- **Checking**

1. Slowly rotate the torque gauge in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction = 35 ± 20mN·m (357 ± 204gf·cm), CW direction = 10 ± 4mN·m (102 ± 41gf·cm), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

- **Adjustment of the brake torque at the supply side and the take-up side**

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk break lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y or the main brake spring.

Note:

When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 13), and the brake torque checking.

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

- **Removal**

1. Loosen the tilt adjusting screw ①.
2. Remove the azimuth adjusting screw ②.
3. Remove the A/C head screw ③.
4. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 22). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the azimuth spring does not fly off when removing the A/C head screw.

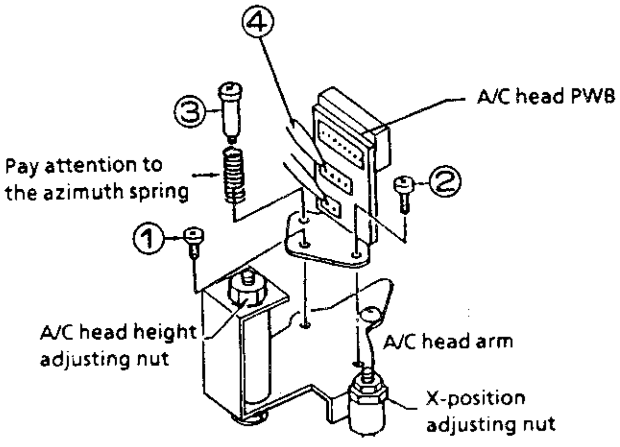

④
A/C head PWB
③
Pay attention to the azimuth spring
②
①
A/C head height adjusting nut
A/C head arm
X-position adjusting nut

Figure 4-26.

- **Replacement**

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. The A/C head assembly is attached so that the A/C head arm and A/C head plate are roughly parallel to each other.

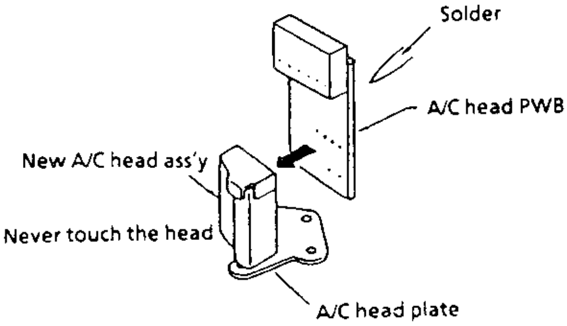

Solder
A/C head PWB
New A/C head ass'y
Never touch the head
A/C head plate

Figure 4-27.

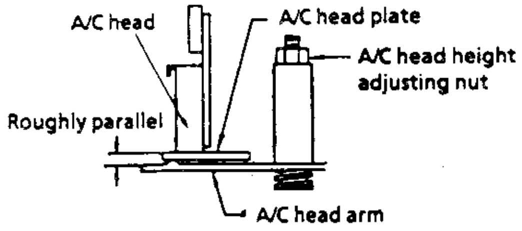
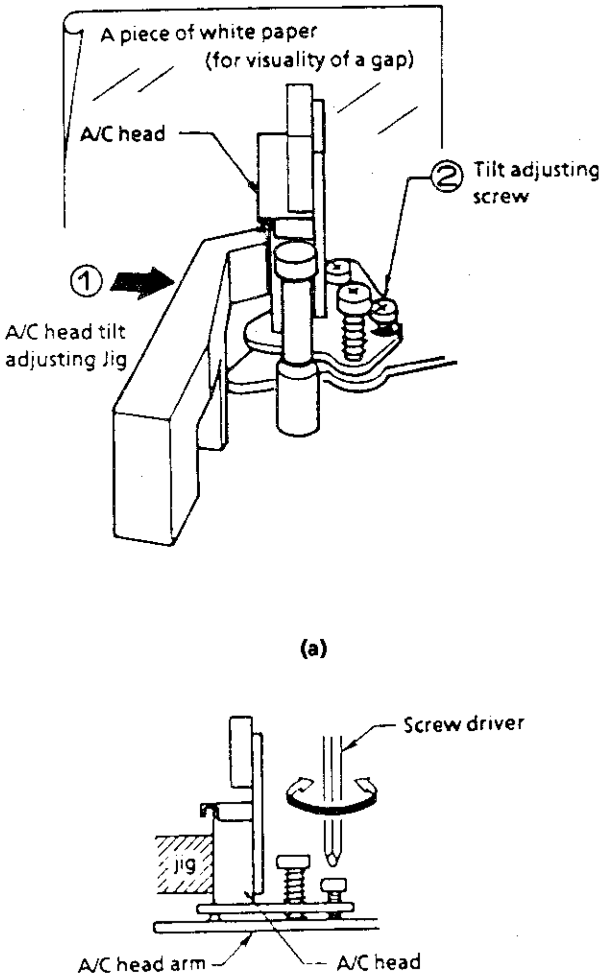

A/C head
A/C head plate
A/C head height adjusting nut
Roughly parallel
A/C head arm

Figure 4-28.

- **Adjustment**

[A/C head tilt angle]

1. Set the mechanism to the loading mode.
2. Place the A/C head tilt adjusting Jig ①.
3. Slowly turn the tilt adjusting screw ② with a screw driver until there is no gap between the Jig and the A/C head.


A piece of white paper
(for visuality of a gap)
A/C head
② Tilt adjusting screw
①
A/C head tilt adjusting Jig
Screw driver
Jig
A/C head arm
A/C head

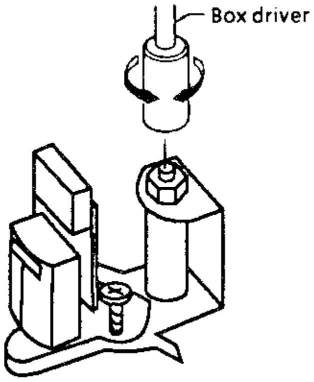
(a)

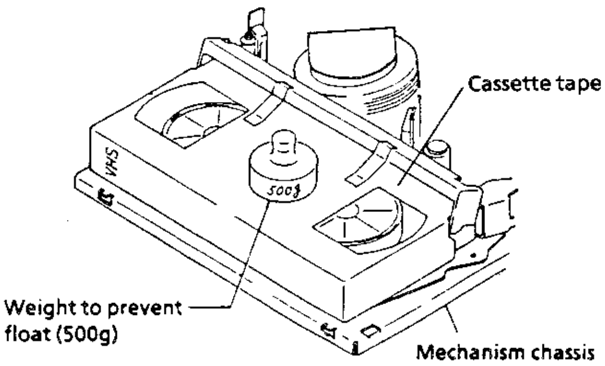
(b)

Figure 4-29.

[A/C head height rough adjustment]

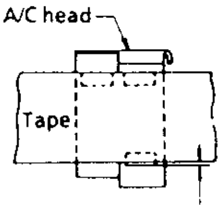
- **Setting**




Cassette tape
500g
Weight to prevent float (500g)
Mechanism chassis

① Roughly adjust the height of the A/C head by turning the A/C head adjusting hexagon nut with the specialized box driver until the tape is in the position shown below.
② Set the cassette tape to the mechanism chassis.
③ Press the PLAY button to the put the unit in the playback mode.

- **Adjustment**


A/C head
Tape

Adjust the nut visually so that the control head is visible 0.3 to 0.5mm below the bottom of the tape.

Figure 4-30.

HEIGHT ADJUSTMENT OF REVERSE GUIDE

[Height adjustment of reverse guide]

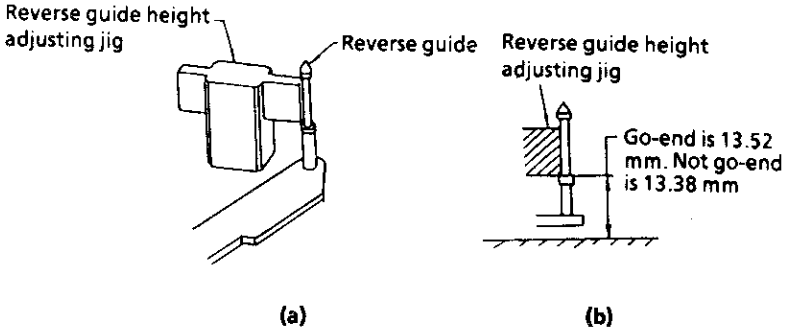

Reverse guide height adjusting jig
Reverse guide
Reverse guide height adjusting jig
Go-end is 13.52 mm. Not go-end is 13.38 mm
(a)
(b)

Figure 4-31.

1. In the tape load mode, make adjustment at the 13.38mm side first and then rotate the height adjusting nut by 1/6 turn counterclockwise.
2. Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
3. Use a commercially available box driver to turn the height adjusting nut.

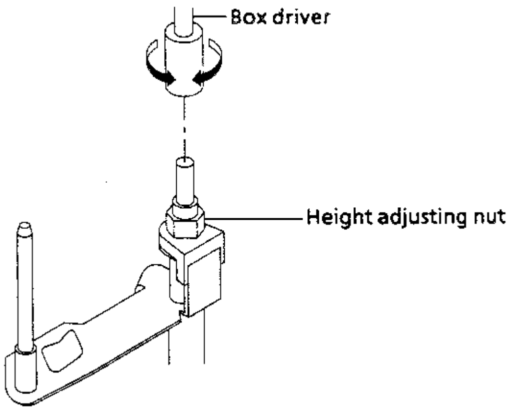

Box driver
Height adjusting nut

Figure 4-32.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor. Now turn on the power.
3. Check and adjust the position of the tension pole. (See page 17.)
4. Check and adjust the video search rewind back tension. (See page 16.)
5. Set the tilt angle of the A/C head. (See page 20.)
6. Rough adjustment of tape drive train.
   a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP2201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
   b) Loosen the setscrew at the lower part of the guide roller, and adjust it with an adjusting screw driver (JIGDRIVERH-4) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-33.)
   c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode.
   (Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)

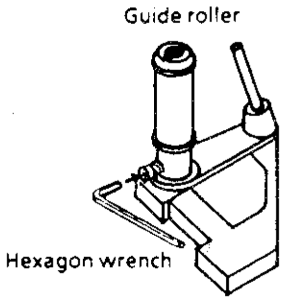


Figure 4-33.

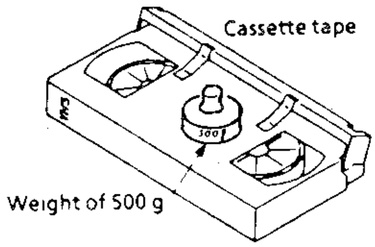
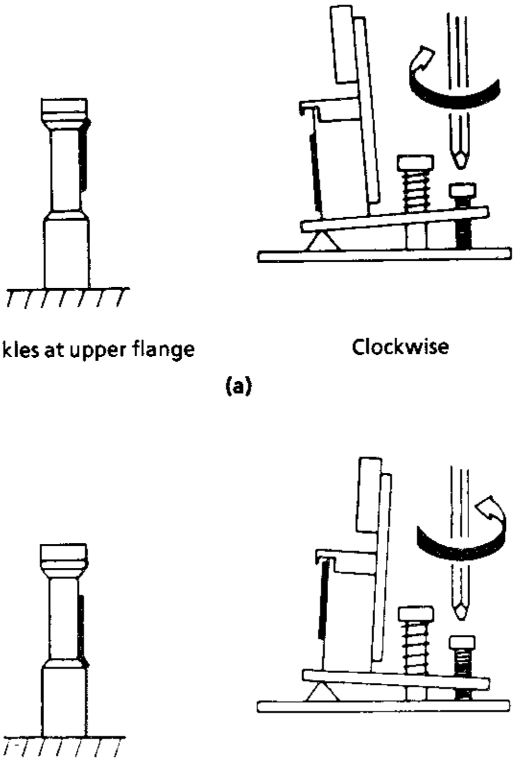


Figure 4-34.

   d) In the X value adjustment mode (see the Electrical Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (–) tracking button, and check a flat response is obtained on the waveform.
   e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
   f) Turn the A/C head tilt adjusting screw with a screwdriver to prevent the tape from wrinkling at the upper and lower flanges of the fixed guide.
      1) Wrinkles at the upper flange : Turn the above adjusting screw clockwise, as shown in Figure 4-35 (a).
      2) Wrinkles at the lower flange : Turn the above adjusting screw counterclockwise, as shown in Figure 4-35 (b).



Wrinkles at upper flange Clockwise

(a)

Wrinkles at lower flange Counterclockwise

(b)

Figure 4-35.

Notes:

1. Place the tracking control in the center position, and adjust the X-position adjusting nut so that the PB CHROMA envelop becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

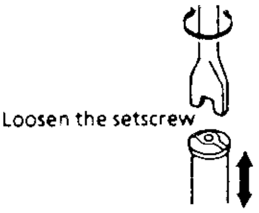


Figure 4-36.

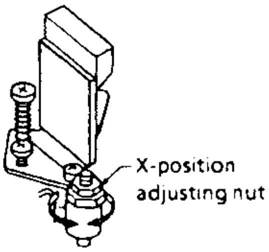


Figure 4-37.

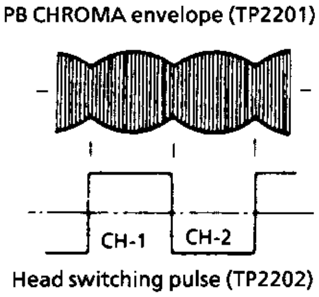


Figure 4-38.

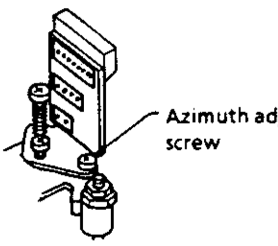


Figure 4-39.

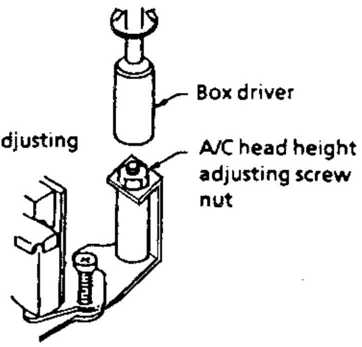


Figure 4-40.

7. Adjustment of A/C head height and azimuth
   a) Connect an oscilloscope to the audio output terminal.
   b) Use the alignment tape and play back its audio 6 kHz signal (monoscope pattern for video signal). Adjust the azimuth adjusting screw to obtain the maximum audio output on an oscilloscope. (See Figure 4-39.)
   c) Use the alignment tape and play back its audio 1 kHz signal (colour bar for video signal) and slowly rotate the A/C head height adjusting nut with the special box driver to obtain the maximum audio output.
   d) Perform the adjustment in b) again.
   e) After this adjustment, apply glyptal to the screws and nuts to fix them.

8. Adjustment of tape drive train and X-Position.
   a) Connect the oscilloscope to the test points (TP2201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
   b) Play back the tape drive train alignment tape.
   c) Push the (+) or (–) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelop waveform that is as flat as possible.
   d) If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-41.
   e) Adjust for maximum flatness of the envelope as the step 6, e) in page 22.

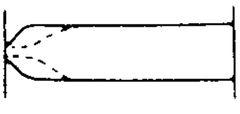
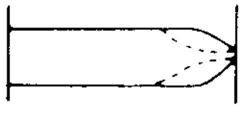
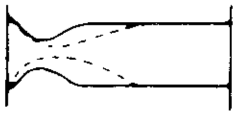
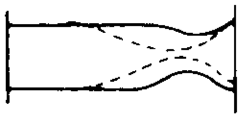
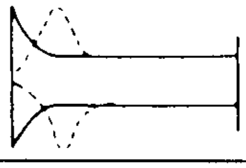
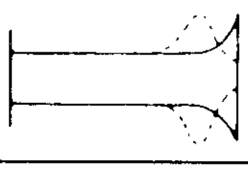
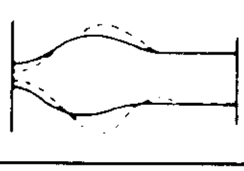
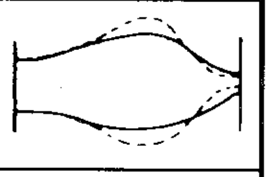
	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
				
				
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-41.

- f) Push the (+) or (–) tracking button to check that a flat response is obtained on the envelope waveform.
- g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
- h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.

8. Adjustment of A/C head X-position.
   - a) In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242), both located at the left on your side on the main PWB, with a 22 ohm resistor to center the tracking.
   - b) Rotate the X-position adjusting nut with an adjusting box driver, and adjust the A/C head position for maximum head switching pulse low side envelope.
   - c) Adjust the playback switching point.
   - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

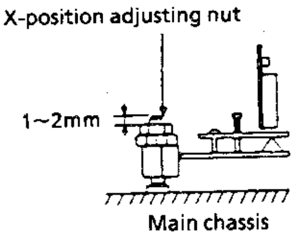


Figure 4-42.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- **Remove the cassette housing control assembly.**

- **Removal (Follow the order of indicated numbers.)**

1. Disconnect from the board-to-board connector on the main PWB.
2. Remove the reel belt ①.
3. Remove the screws ②.

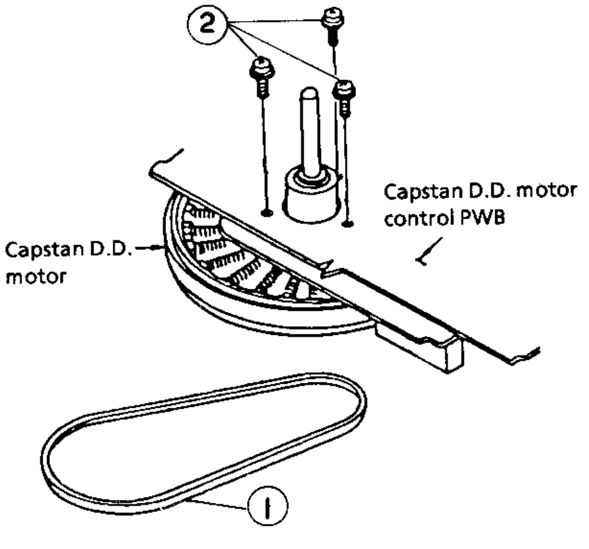


Figure 4-43.

- **Reassembly**

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Attach the reel belt. Reconnect to the board-to board connector on the main PWB.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check the servo circuit.

REPLACEMENT OF DRUM D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

- **Removal (Reverse the order in reassembly.)**

1. Disconnect the FFC cable ①.
2. Unscrew the stator assembly fixing screws ②.
3. Take out the stator assembly ③.
4. Unscrew the rotor assembly fixing screws ④.
5. Take out the rotor assembly ⑤.

Notes:

1. In removing the stator assembly, part of the drum earth spring pops out of the pre-load collar.
   Be careful not to lose it.
2. Secure the rotor assembly so that the installation positioning holes in the rotor assembly and upper drum assembly match.
   (Match the upper drum's notch with the rotor's hole.)
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the stator assembly are not damaged by the rotor assembly or other parts.
5. After installation, adjust the playback switching point.

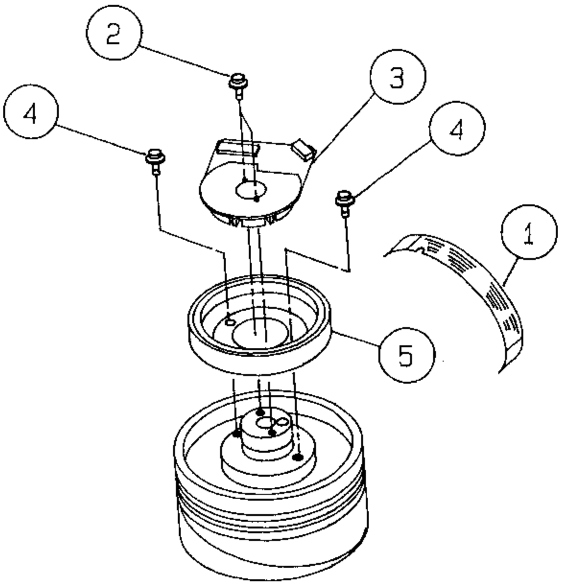


Figure 4-44.

REPLACEMENT OF UPPER DRUM (2-head/4-head drum models are applicable here. Hi-Fi models are equipped with an upper-and-lower drum assembly.)

Note:

The gap between the lower drum and the upper drum is very accurate, in the order of microns, and care should be paid to their replacement. Even a slight amount of foreign material will affect the accuracy of their reassembly.

- **Replacement (Follow the order of the indicated numbers.)**

① Remove the drum earth brush and its spring ①.
② Put a mark for the direction of the pre-load collar and the drum shaft ②.
③ Loosen the set screws (M4) ③ of the pre-load collar. Take out the pre-load collar upward.
④ Pull up the upper drum ④ out of position.

Note:

1. Remove the drum motor, referring to the drum motor replacement.
2. Put a mark, with a marking pen or the like, in order to identify the direction of the pre-load collar and the drum shaft. Now remove the pre-load collar.
3. Be careful not to lose the drum earth brush and drum earth brush spring.
   Handle the brush with care not to allow any dust and foreign matters on it.
4. Avoid touching the drum surface with bare hands.
5. Pull out the upper drum with care so that it may not be tilted.
6. Do not hit the screws when tightening them.

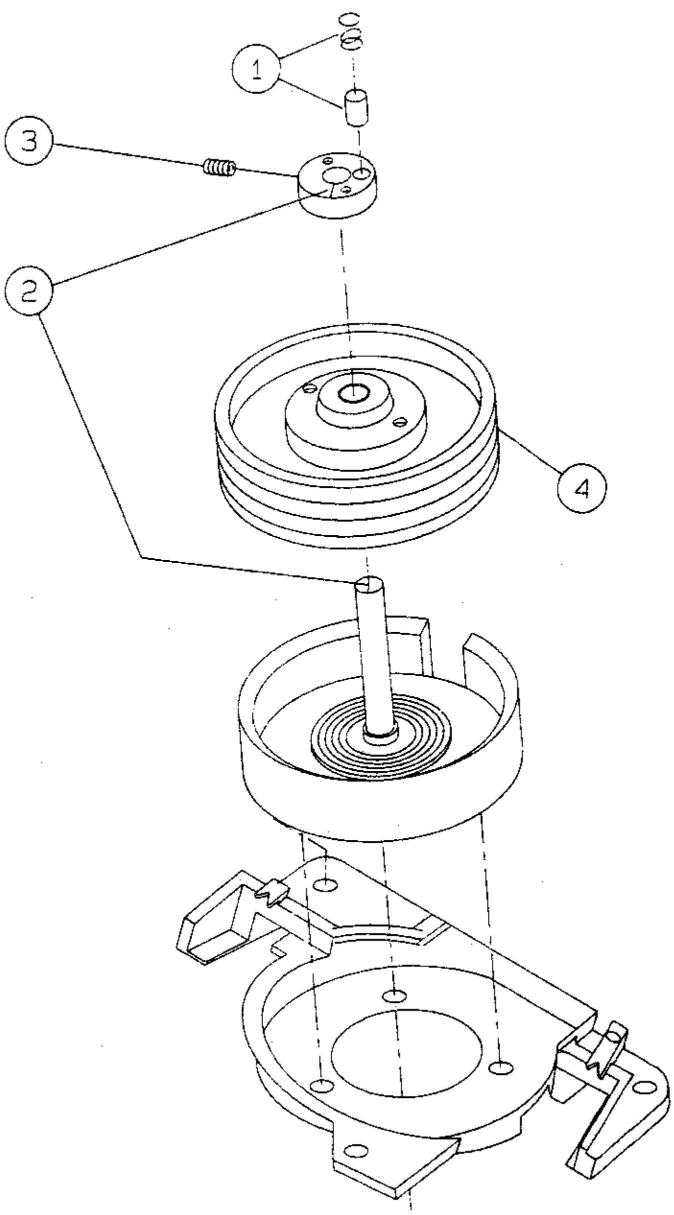


Figure 4-45.

- **Drum replacement (for 2/4 drums; drum assembly supplied for Hi-Fi models)**

1. Clean up the drum shaft.
2. Make a clearance at the rotary transformer. This is an important procedure to maintain the performance.
   1) Some rotary transformer clearance shims are packaged in the servicing upper drum assembly or lower drum assembly. Install the thinnest (0.06 mm) of the shims onto the lower drum shaft. (Refer to Fig. 4-46(a) for thickness.)
   2) Install the upper drum assembly onto the drum shaft.
   3) Install the pre-load collar.
   4) Exert a force of 14.7 N (1.5 kgf) on the pre-load collar from above (using a commercially available load meter). Tighten up the set screws (M4) of the pre-load collar.
   5) Turn the upper drum by hand and listen to see if the rotary transformer gives no rubbing sound.
   6) If the transformer sounds, replace the installed shim with the next thicker shim.
      Take the above steps 1) thru 5) until no rubbing sound is heard any longer.
   7) Make sure no rubbing sound is heard. Finally add the 0.03 mm thick shim.
3. Place the pre-load collar back in position in the direction marked in disassembling. (See Fig. 4-45. for setting.)
4. Exert a force of 14.7 N (1.5 kgf) upon the pre-load collar from above. Tighten up the set screws of the pre-load collar (1.18 Nm (12 kgf·cm)).
5. Place the drum earth brush, drum earth brush spring and drum motor back in position.
6. After replacement, be sure to check the tape drive train adjustment (See page 22.) and the following electric adjustments.
   - Adjustment of the playback switching point.
   - Checking and adjustment of the X-position.
   - Adjustment of SP slow tracking preset.

- **Precautions in drum replacement**

1. The drum assembly is very delicate. Handle it with enough care.
2. Be certain that the drum surface is free from dust, dirt and any other foreign matters.
3. Carefully adjust the rotary transformer clearance because this adjustment is important in order to maintain the performance.
4. Install the upper drum straight down to the drum shaft. Do not apply any excessive force upon the upper drum.
5. Finally clean up the drum.

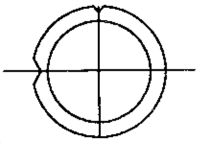
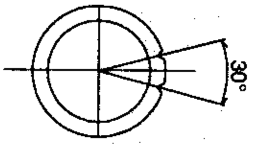
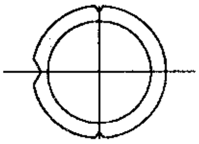
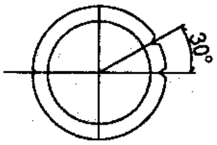
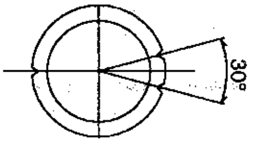
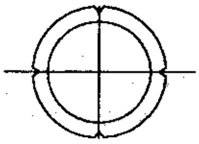
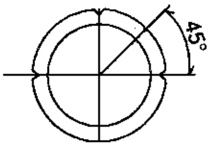
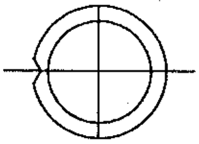
No	Thickness (mm)	Shape	No	Thickness (mm)	Shape
1	t = 0.060		5	t = 0.100	
2	t = 0.070		6	t = 0.110	
3	t = 0.080		7	t = 0.120	
4	t = 0.090		8	t = 0.030	

Figure 4-46(a).

Shim thickness variations

Pre-load collar set-up direction

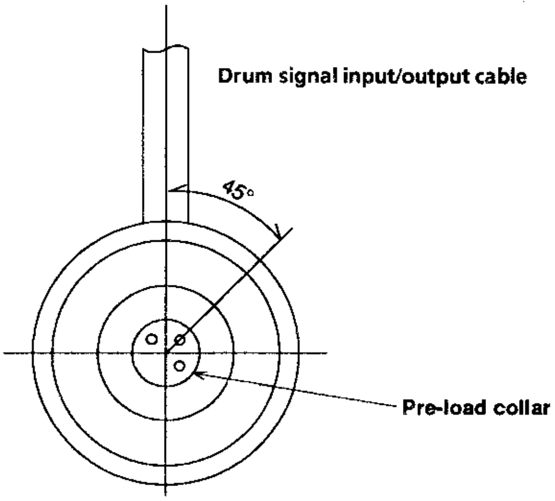

Drum signal input/output cable
45°
Pre-load collar

Figure 4-46(b).

ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.

1. **Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).**
2. **Mounting the shifter (on the back of the mechanism chassis).**
3. **Mounting the master cam (on the back of the mechanism chassis).**
4. **Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).**

1. Assembling the pinch roller assembly and the pinch drive cam (on the front of the mechanism chassis).

Place the following parts in position in numerical order.

(1) Pinch drive cam ①
(2) Pinch roller and pinch double-action lever ②
(3) Open lever ③

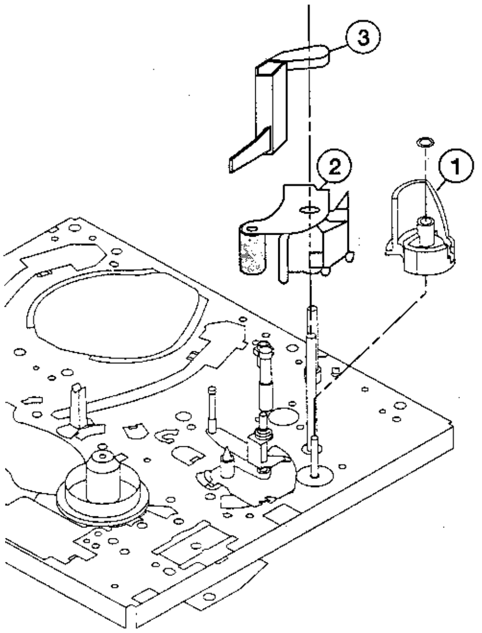
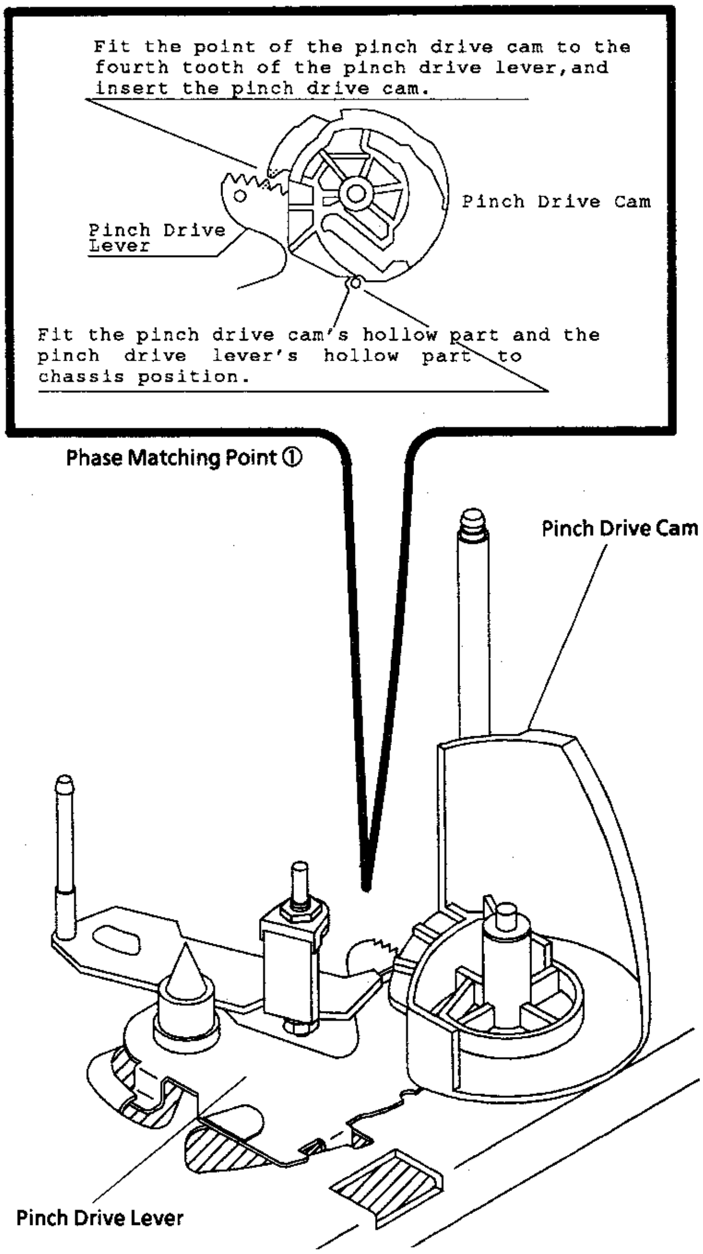


Figure 4-47.

① Insert Pinch Drive Cam.



Fit the point of the pinch drive cam to the fourth tooth of the pinch drive lever, and insert the pinch drive cam.

Fit the pinch drive cam's hollow part and the pinch drive lever's hollow part to chassis position.

Figure 4-48-1.

② Insert Pinch Roller/Pinch Double Action Lever Ass'y.

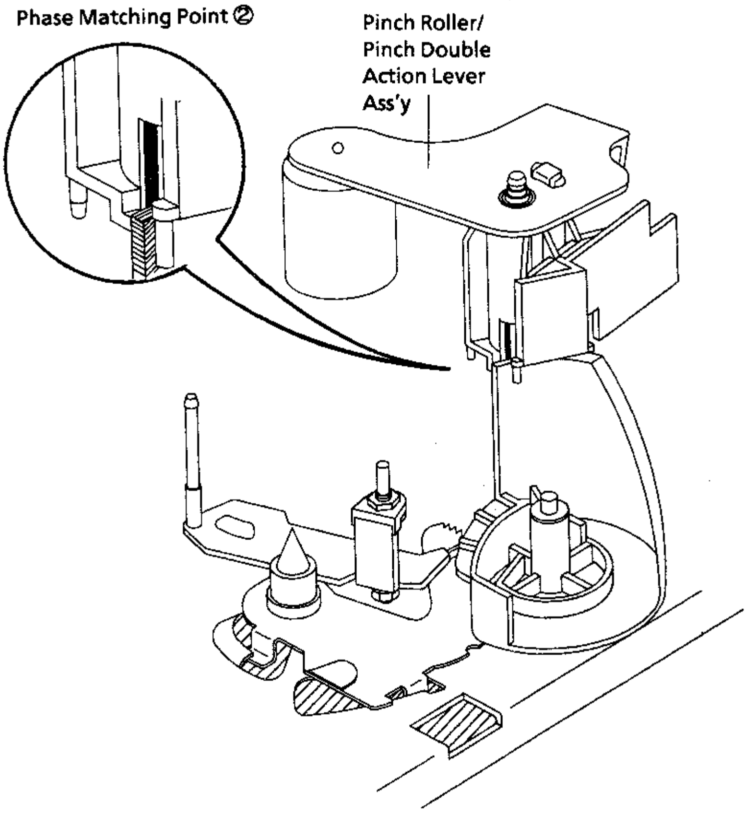

Phase Matching Point ②
Pinch Roller/
Pinch Double
Action Lever
Ass'y

Figure 4-48-2.

③ Insert Open Lever.

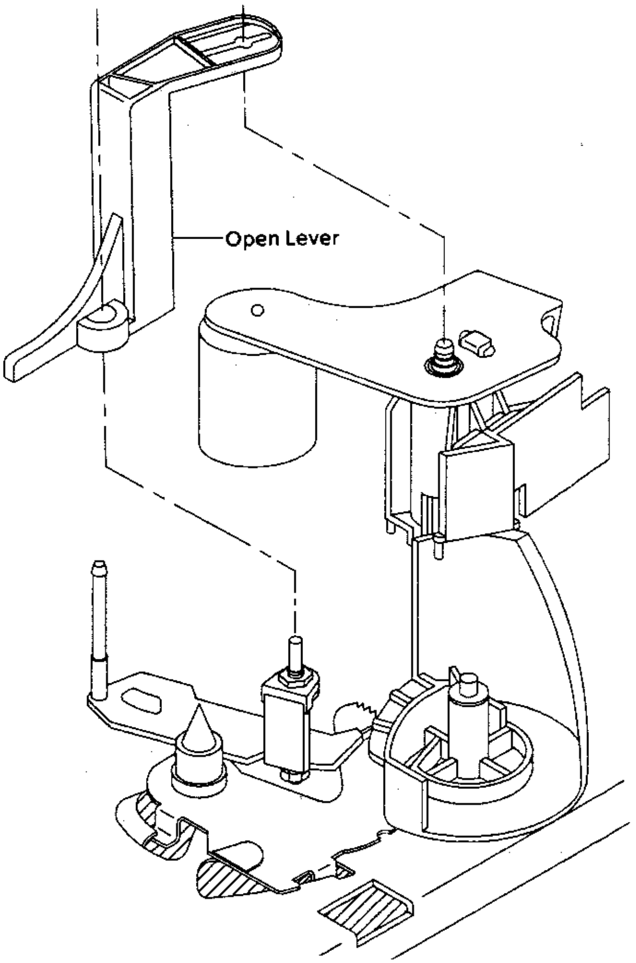
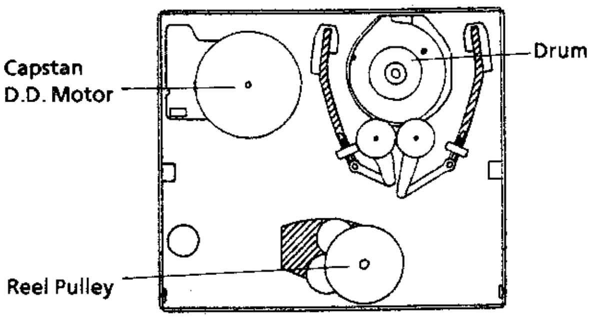


Figure 4-48-3.

2. Mounting the shifter (on the back of the mechanism chassis).


Capstan
D.D. Motor
Drum
Reel Pulley

(Bottom Side of mechanism chassis)

Figure 4-49.

1. Make sure that the loading gear is at the point (1) as shown below.
2. Place the shifter in position, keeping in mind the 7 insertion points and the five relief points.
3. For the phase matching at the insertion point (1), see the point (2) as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ⑥.

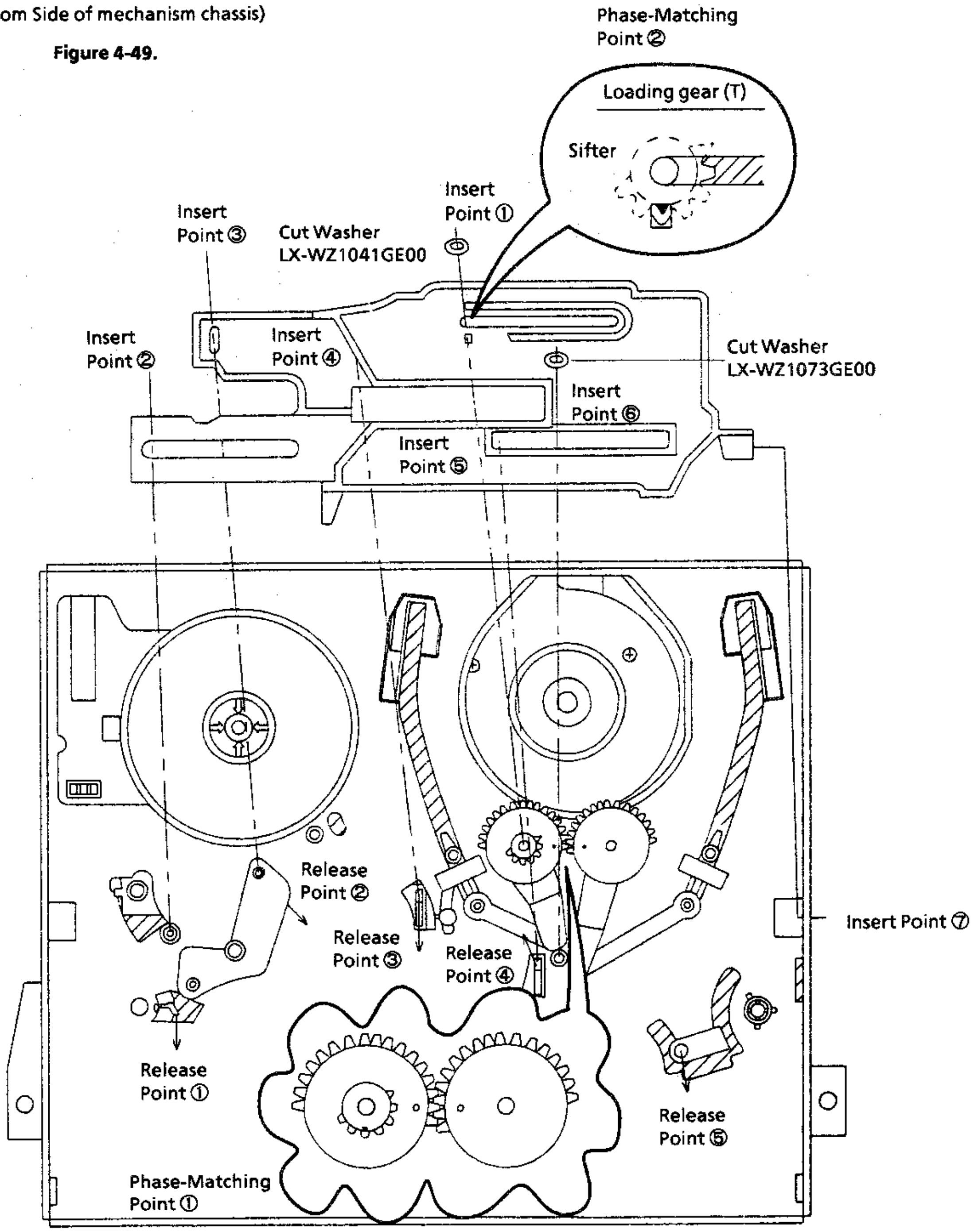

Phase-Matching
Point ②
Loading gear (T)
Sifter
Insert
Point ①
Insert
Point ③
Cut Washer
LX-WZ1041GE00
Insert
Point ②
Insert
Point ④
Cut Washer
LX-WZ1073GE00
Insert
Point ⑥
Insert
Point ⑤
Release
Point ②
Release
Point ③
Release
Point ④
Insert Point ⑦
Release
Point ①
Release
Point ⑤
Phase-Matching
Point ①

Figure 4-50.

3. Mounting the master cam (on the back of the mechanism chassis).

(1) Make sure beforehand that the shifter is at the point as shown below.

(2) Place the master cam in the position as shown below.

Note:

See the figure below for the phase matching between the master cam and the cassette control drive gear.

(3) Finally fix the master cam with E ring.

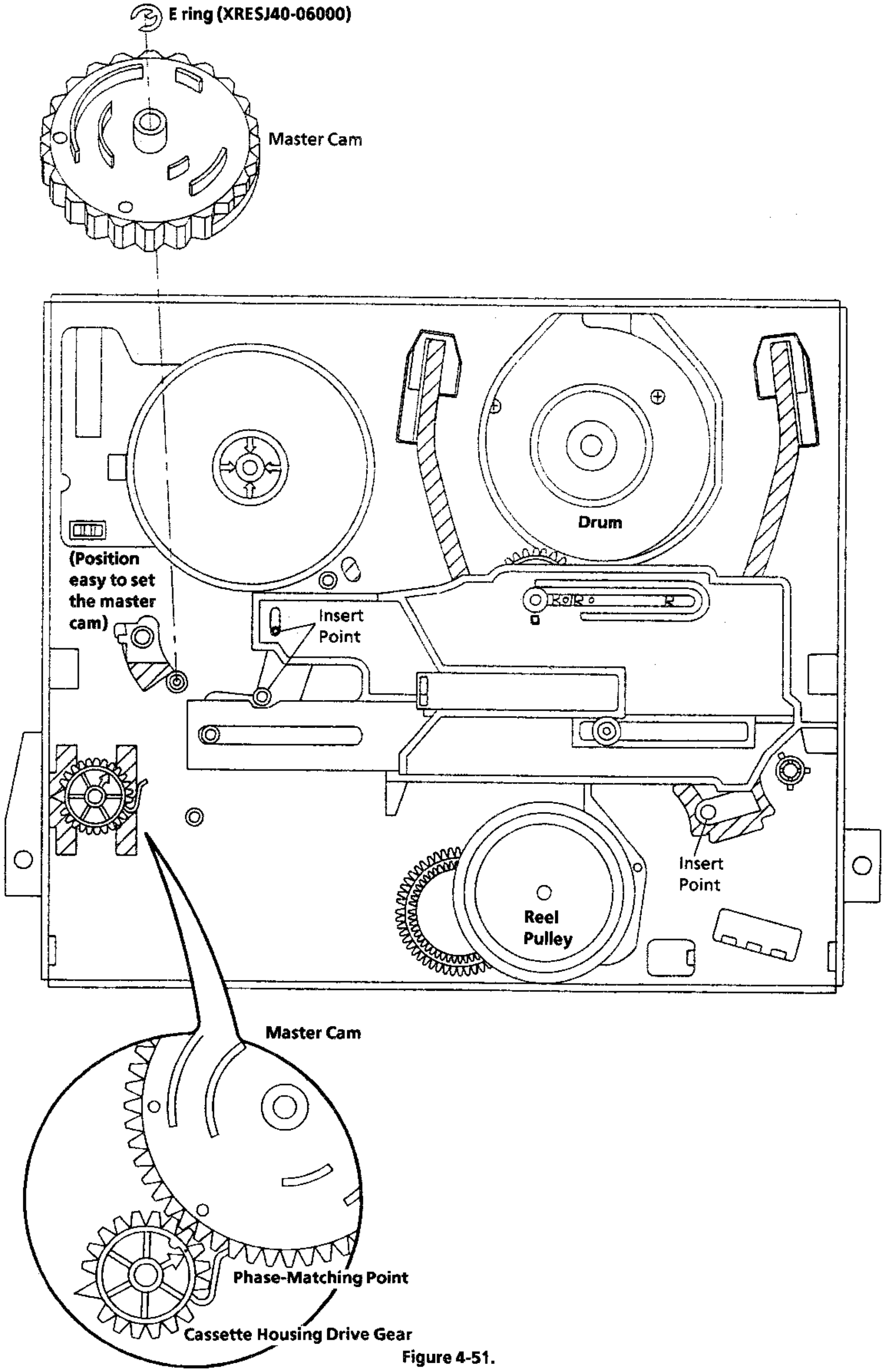

E ring (XRESJ40-06000)
Master Cam
Drum
(Position easy to set the master cam)
Insert Point
Insert Point
Reel Pulley
Master Cam
Phase-Matching Point
Cassette Housing Drive Gear

Figure 4-51.

4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

(1) Assemble the connect gear.
(2) Assemble the slow brake.
(3) Assemble the loading motor unit.

Note:
Let the slow brake leg out of the front of the mechanism chassis. Catch the spring to the take-up fixing guide that is at the left of the A/C head.

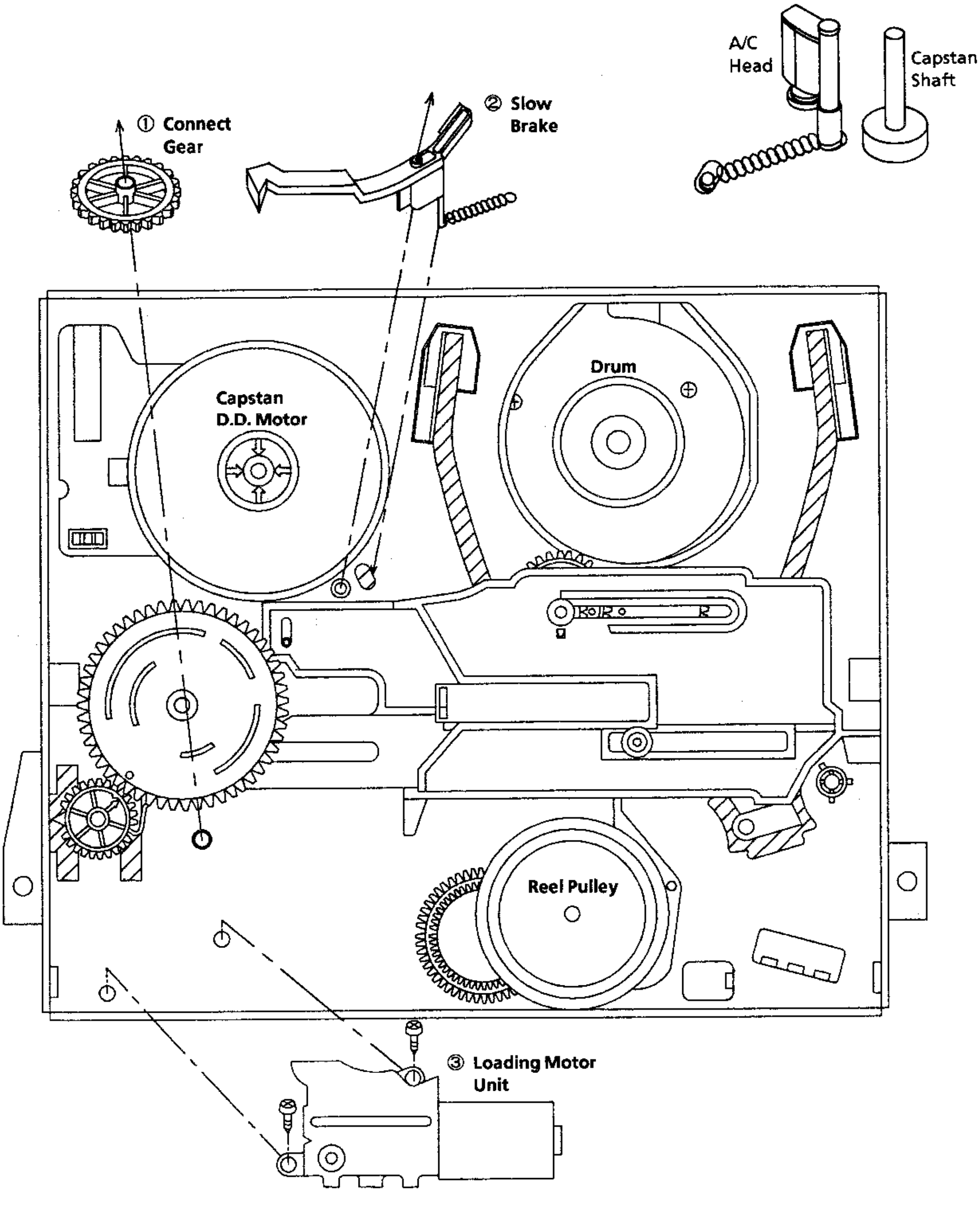

A/C Head
Capstan Shaft
① Connect Gear
② Slow Brake
Drum
Capstan D.D. Motor
Reel Pulley
③ Loading Motor Unit

Figure 4-52.

Note:
Before setting up the loading motor, make sure the phase is matched. To do so, turn the connection gear clockwise and check to see if the loading is complete and if the pinch roller comes into contact.

When these actions are made smoothly, return the mechanism to the state as shown above. Finally mount the loading motor unit.

REPLACEMENT OF LOADING MOTOR

- **Removal**

Remove 2 screws.

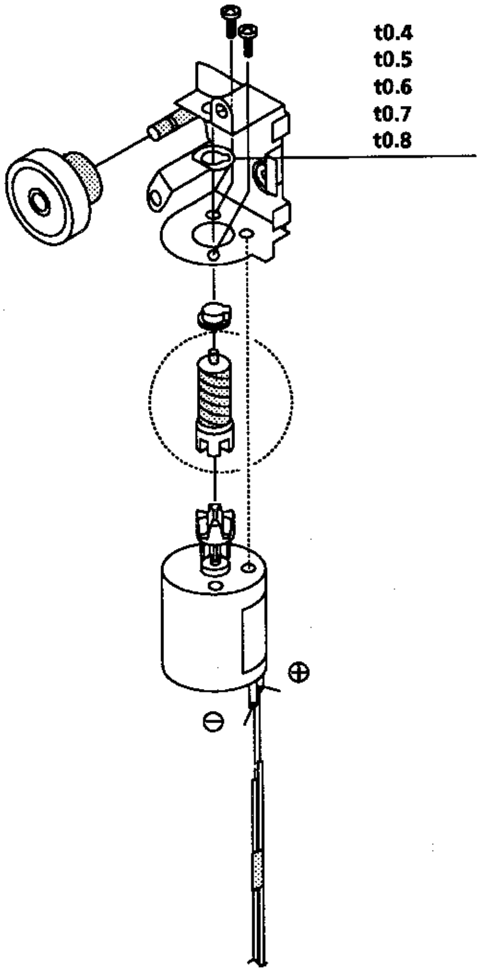


Figure 4-53.

- **Replacement**

① Take out the old loading motor. Place a replacement loading motor as shown above (figure 4-53.).

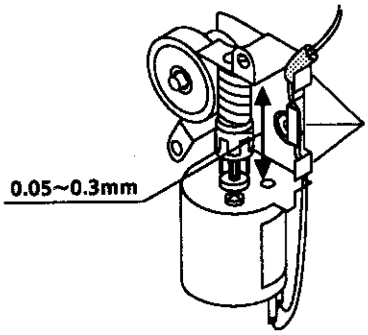
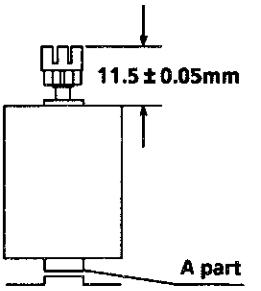


Figure 4-54.

② Adjust the worm gear's thrust gap to 0.05 to 0.3 mm.
Use the specific washers for an appropriate thickness.



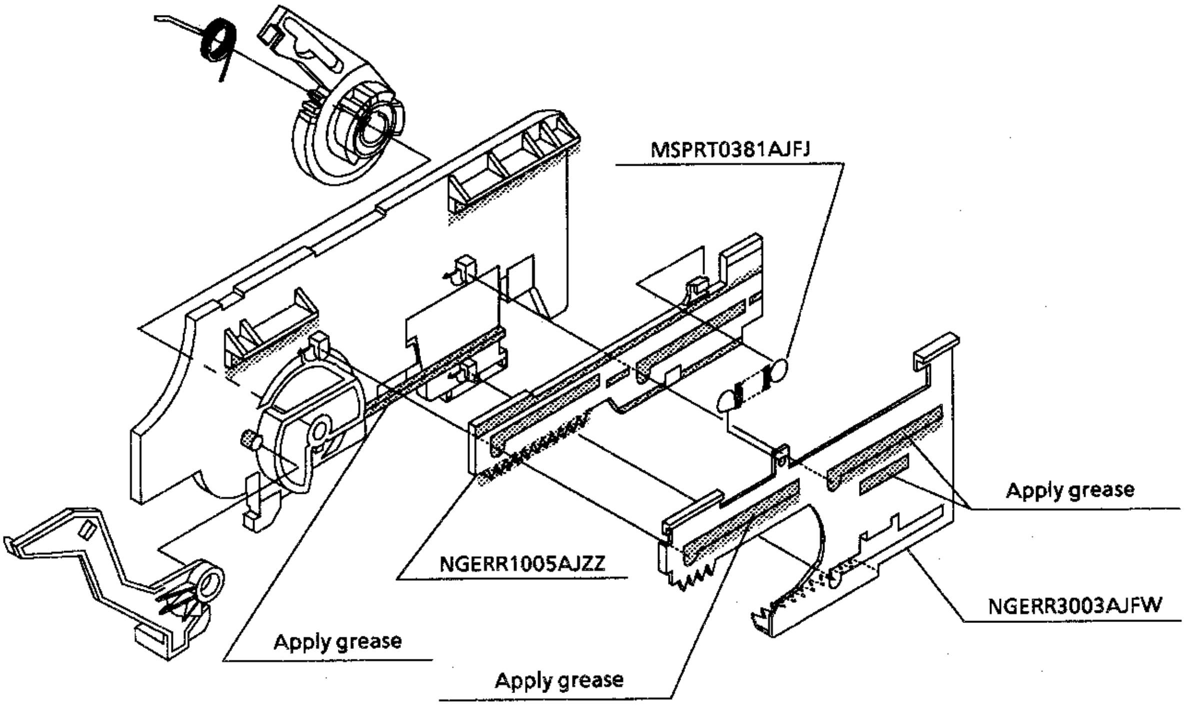
To press the motor in, receive it by portion A.

Figure 4-55.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is 11.5 ± 0.05 mm away from the motor.

ASSEMBLY OF CASSETTE HOUSING

① Drive Gear R and Drive Angle Ass'y


MSPRT0381AJFJ
Apply grease
NGERR1005AJZZ
NGERR3003AJFW
Apply grease
Apply grease

Phase Matching Point

- Fix the drive angle ass'y to the drive gear R as shown in the figure.

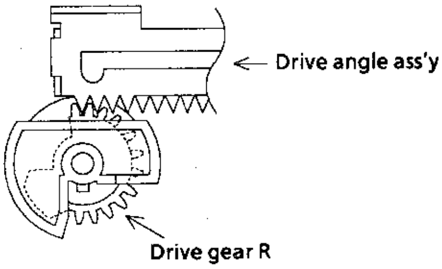

Drive angle ass'y
Drive gear R

Figure 4-56.

② Synchro Gear, Drive Gear L and Drive Gear R

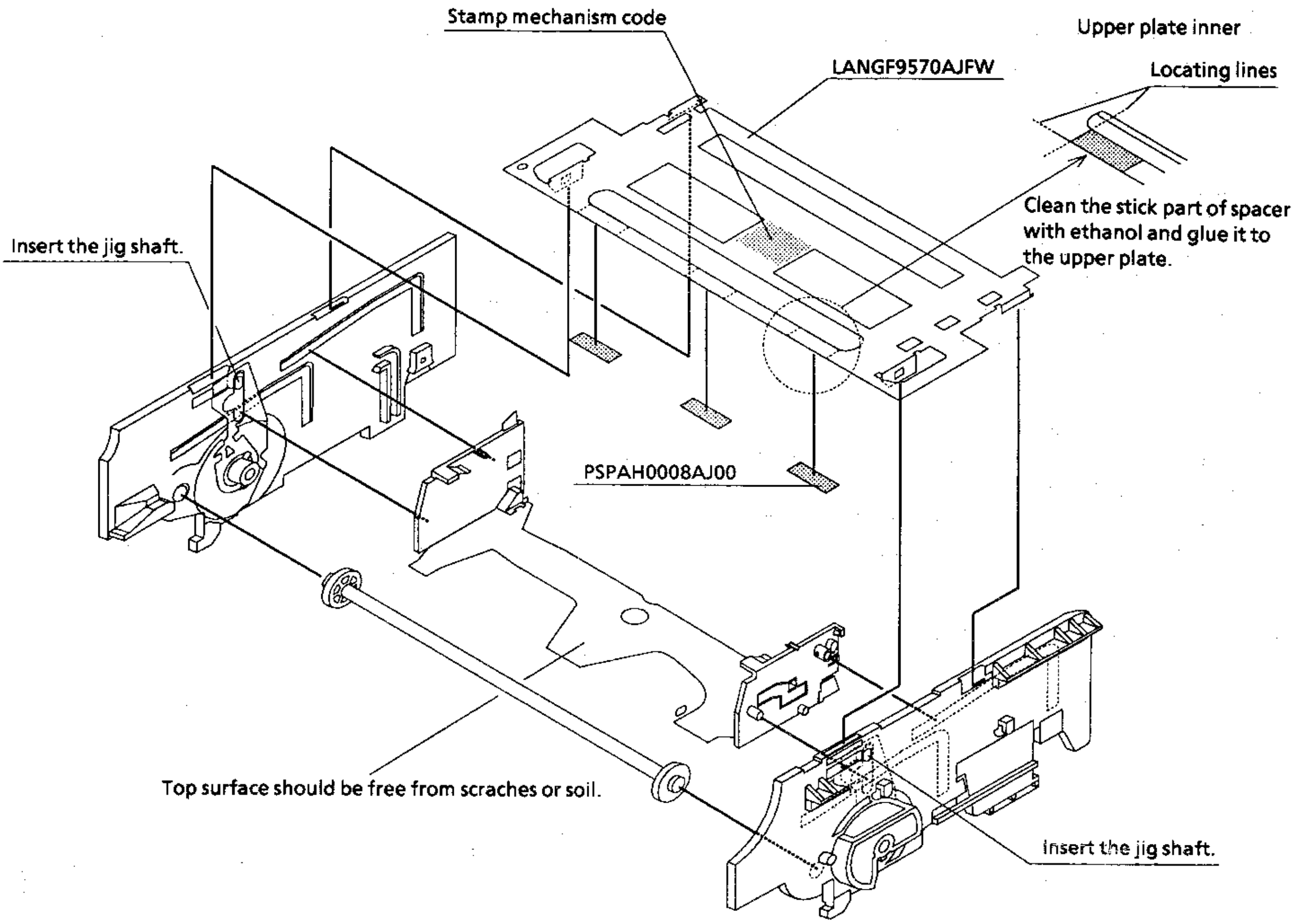

Stamp mechanism code
Upper plate inner
LANGF9570AJFW
Locating lines
Clean the stick part of spacer with ethanol and glue it to the upper plate.
Insert the jig shaft.
PSPAH0008AJ00
Top surface should be free from scraches or soil.
Insert the jig shaft.

Figure 4-57.

Phase Matching Point

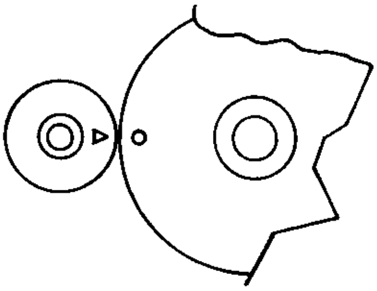


Figure 4-58.

Align the drive gear's round hole with the synchro gear's triangular (△) symbol. Do this alignment for both the drive gears.

Note:
Do not over-turn both of the drive gears when the phase has been matched. These gears are partially toothless and might come out of mesh with the synchro gear. In such a case, the phase needs re-matching.

5. ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:
  Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.
  Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:
  ◎Colour TV monitor
  ◎Audio signal generator
  ◎DC voltmeter
  ◎Blank video cassette tape
  ◎Screwdriver for adjustment
  ◎Colour bar signal generator
  ◎Dual-trace oscilloscope
  ◎AC milli-voltmeter
  ◎Frequency counter
  ◎Alignment tape (VROCPSV)

※ Servicing precautions
When the IC804 (E²PROM) has been replaced, make the following reprogramming. Depending on models, the IC804 (E²PROM) has been factry-adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

- Location of controls and test points

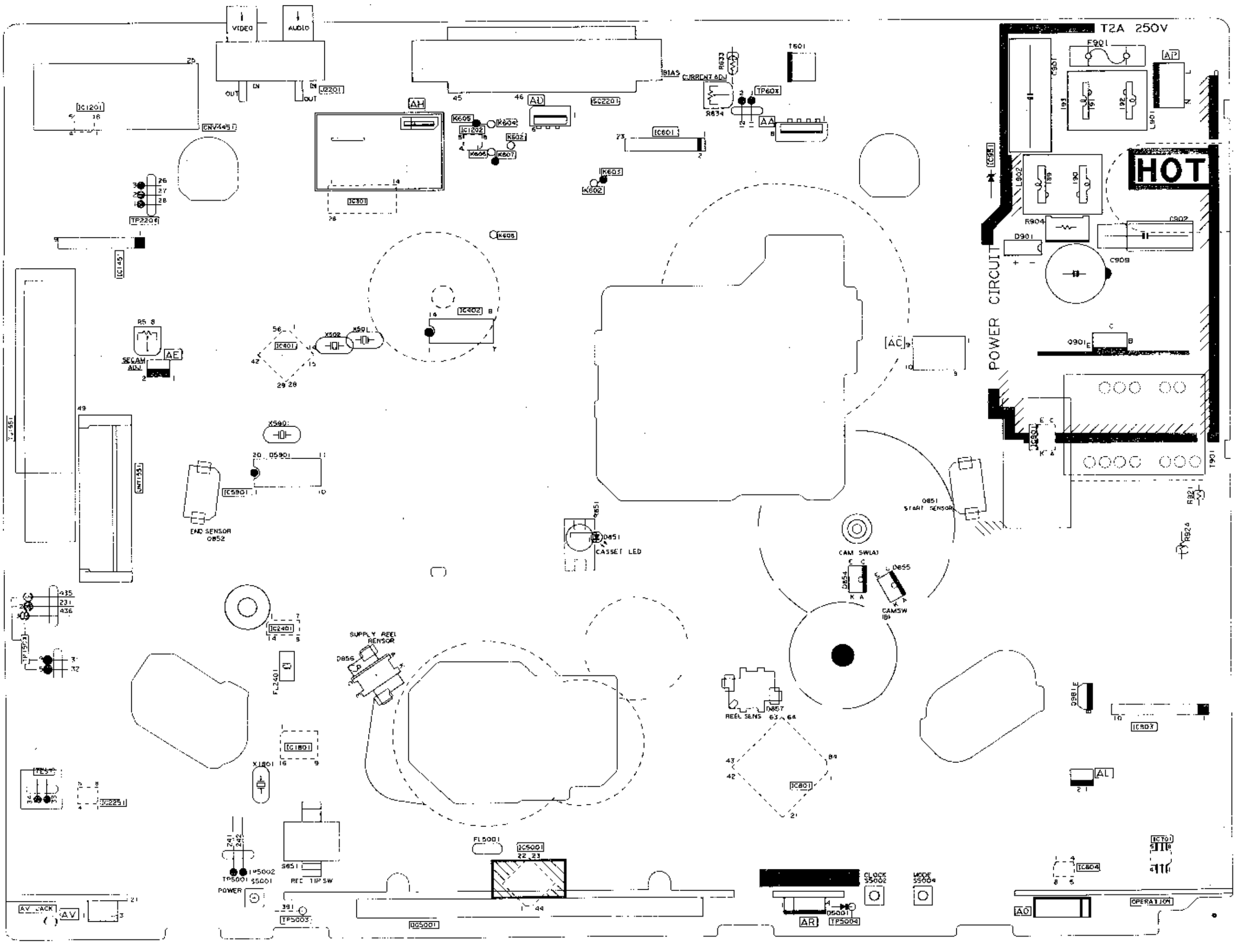

VIDEO
AUDIO
T2A 250V
F901
AP
HOT
POWER CIRCUIT
IC1201
IC2201
CNV4451
TP2201
AH
AD
IC601
TP601
BIAS CURRENT ADJ
AA
AC
AE
SECAM ADJ
IC401
IC402
IC5901
X590
END SENSOR Q852
D451 CASSET LED
START SENSOR
CAM SW(A)
CAMSW (B)
SUPPLY REEL SENSOR
D856
REEL SENS
IC2401
IC1801
X1801
IC801
IC803
AL
IC2251
TEST
TP5001
POWER
REC TIP SW
FL5001
IC5001
TP5003
CLOCK S5002
MODE S5004
AR
TP5004
AO
IC804
IC701
OPERATION
AV JACK
AV

Figure 5-1.

5. ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:
  Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.
  Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:
  ◎Colour TV monitor
  ◎Audio signal generator
  ◎DC voltmeter
  ◎Blank video cassette tape
  ◎Screwdriver for adjustment
  ◎Colour bar signal generator
  ◎Dual-trace oscilloscope
  ◎AC milli-voltmeter
  ◎Frequency counter
  ◎Alignment tape (VROCPSV)

※ Servicing precautions
When the IC804 (E^2PROM) has been replaced, make the following reprogramming. Depending on models, the IC804 (E^2PROM) has been factry-adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

- Location of controls and test points

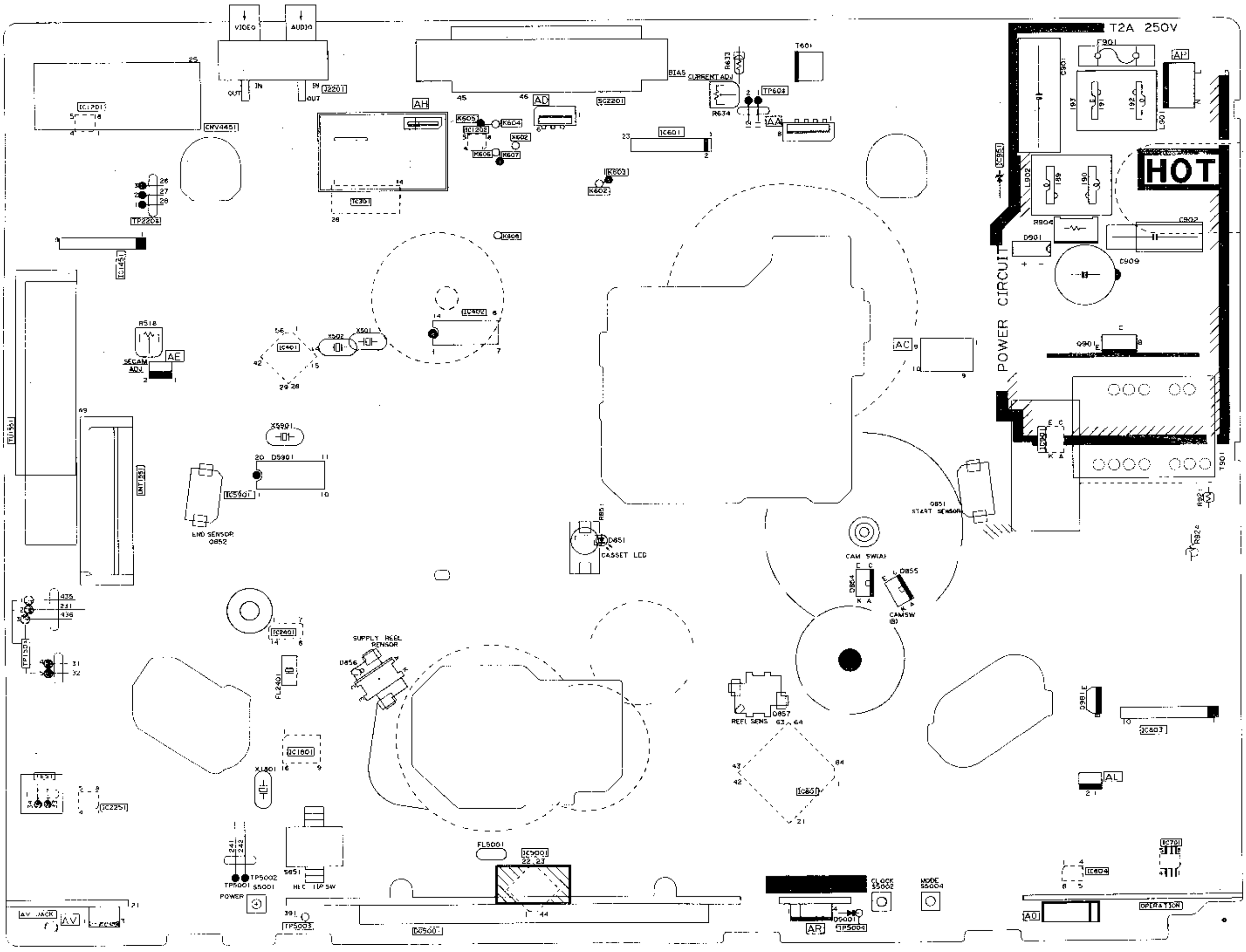

VIDEO
AUDIO
T2A 250V
HOT
POWER CIRCUIT
CURRENT ADJ
SECAM ADJ
AH
AD
AA
AP
AE
AC
AL
AV
AR
AO
CASSET LED
END SENSOR
START SENSOR
CAM SW(A)
CAMSW (B)
SUPPLY REEL SENSOR
REEL SENS
CLOCK
MODE
POWER
OPERATION
AV JACK

Figure 5-1.

② Synchro Gear, Drive Gear L and Drive Gear R

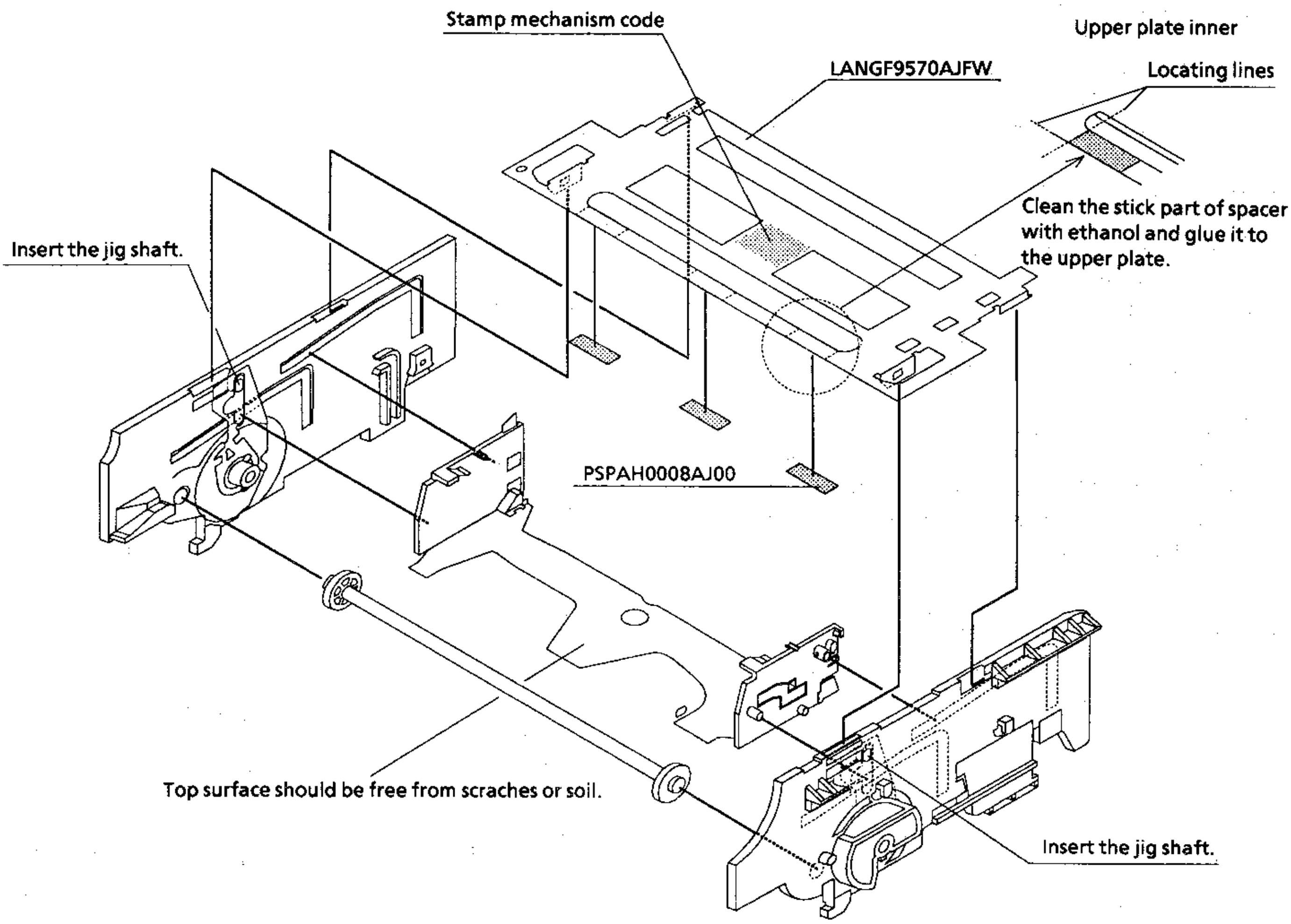

Stamp mechanism code
Upper plate inner
LANGF9570AJFW
Locating lines
Clean the stick part of spacer with ethanol and glue it to the upper plate.
Insert the jig shaft.
PSPAH0008AJ00
Top surface should be free from scraches or soil.
Insert the jig shaft.

Figure 4-57.

Align the drive gear's round hole with the synchro gear's triangular (△) symbol. Do this alignment for both the drive gears.

Phase Matching Point

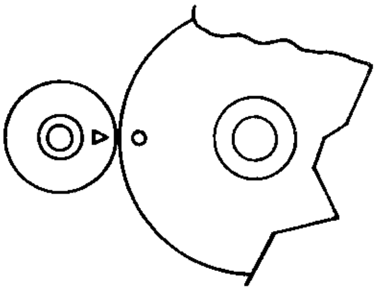


Figure 4-58.

Note:
Do not over-turn both of the drive gears when the phase has been matched. These gears are partially toothless and might come out of mesh with the synchro gear. In such a case, the phase needs rematching.

SERVO CIRCUIT ADJUSTMENT

ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP2202 (H. SW. P.) to CH-1 VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), Internal trigger at CH-1 side.)
Specification	6.5 ± 0.5H (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
   (Playback picture on the monitor screen.)
2. Make for a moment short-circuit between jumper pins 33 and 34 , both located at the left on your side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode. (See Note below)
3. Press the PLAY button.
   Be sure the "PLAY" appears in the fluorescent display tubes flashing (about 1Hz) into the auto PG adjustment operating.
   Note:
   When the manual PG adjustment, observe the waveform with an oscilloscope and make adjustment FF or REW button so that the specification.
4. Stop the "PLAY" appears in the flashing of fluorescent display tubes at adjusted.
5. Press the STOP button in the return to normal mode.
6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 5-2. just after the head switching point have been adjusted.

Notes:

① Set-up of TEST mode.
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.

② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.

1) Replug the AC power cord a few minute later.
2) Make a short-circuit between TP5001 (or jumper pin 241) and TP5002 (or jumper pin 242) , both located at the left on your side on the main PWB, with a 22 ohm resistor to center the tracking.
3) AC power cord is plugged in.
4) You can make mechanism operating mode. Replug the AC power cord a few minute later.

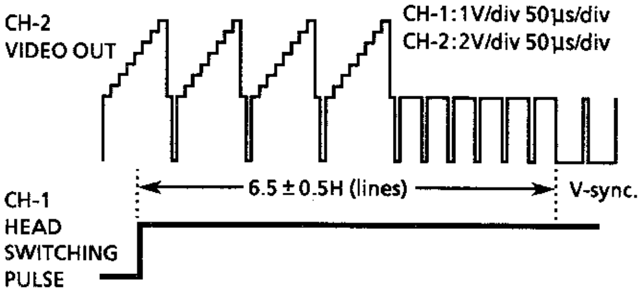


Figure 5-2.

ADJUSTMENT OF SP/LP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode) (See Note below)
Control	Tracking control buttons (+) or (−)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
6. Look at the monitor screen and adjust the (+) or (−) TRACKING buttons so that the there is noise disappears from the screen.
5. Make for a moment short-circuit between jumper pins 33 and 34, both located at the left on your side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.

② The TV program will not be recorded if RCA or 21pin plugs are pluged in to the AUDIO/VIDEO input terminals.

ADJUSTMENT OF FV (False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below ②)
Control	Tracking control buttons (+) or (−)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (−) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.
   (For the LP mode put adjustment at the same adjustment way as SP mode.)

Note:

① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.

② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

Y/C CIRCUIT ADJUSTMENT

CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	1.0 ± 0.1Vp-p

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
   (See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0 Vp-p as shown in Figure 5-3.

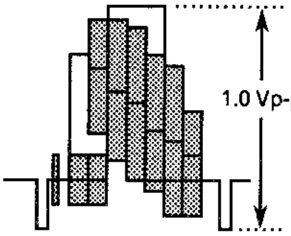


Figure 5-3.

Note:
If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin (48) of IC401, GND
Specification	190 ± 5% (See note below)

1. Connect a oscilloscope to Pin (48) of IC401 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 5-4.

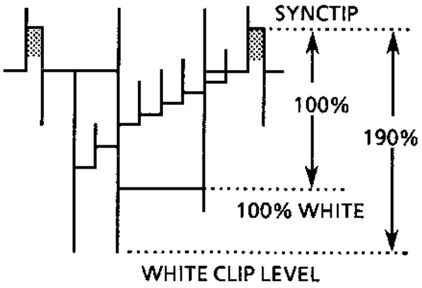


Figure 5-4.

Note:
From sync tip to white peak, the level is 100%.
The white clip level is 90% above the white level.

CHECKING OF RECORD LEVEL

Measuring instrument	Oscilloscope
Mode	Record mode
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin (26) of IC301, GND.
Specifications	4head models (SP mode) Chroma (Red) : 47 ± 4mVp-p Sync tip : 200 ± 30mVp-p 4head models (LP mode) Chroma (Red) : 34 ± 3mVp-p Sync tip : 170 ± 20mVp-p

1. Feed the colour bar signal to the VIDEO IN jack and set the unit in recording mode.
2. Connect an oscilloscope to shown in table.
3. Make a short circuit between pin (52) of IC401 and the GND using a 47µF/16V capacitor to minimize the FM luminance signal.
4. Make sure so that the amplitude of the chroma (red) portion is specified as shown in Figure 5-5(a).
5. Disconnect the capacitor that was connected in step 3.
6. Make sure so that the amplitude of the sync tip portion is specificed as shown in Figure 5-5(b).

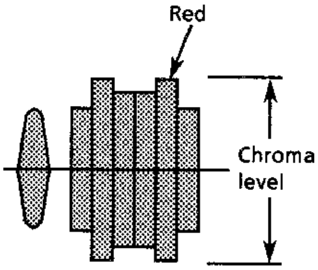


Figure 5-5(a).

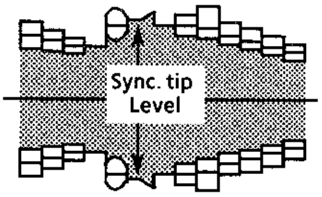


Figure 5-5(b).

CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	1.0 ± 0.1Vp-p

1. Be sure that E-E level has been correctly specificed.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
   (See Note below.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-6.

Note:
If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

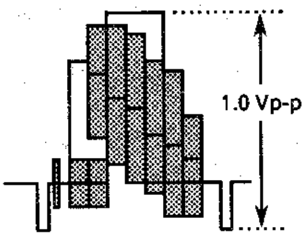


Figure 5-6.

AUDIO CIRCUIT

CHECKING OF E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E/Record
Input signal	1kHz, – 8.0dB (at RCA type jack) 1kHz, – 3.8dB (at 21 pin type jack)
Test point	AUDIO OUT jack
Specification	– 8.0 ± 2dB (at RCA type jack) – 3.8 ± 2dB (at 21 pin type jack)

1. Connect an oscilloscope to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Put the unit in E-E or recording mode.
4. Make sure that the output level is value shown in table.

CHECKING OF AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter.
Mode	Playback
Input signal	Alignment tape. (VROCPSV) (1kHz level conrtol signal)
Test point	AUDIO OUT jack
Specification	-9^{+2dB}_{-1dB}

1. Playback the Alignment tape. (VROCPSV 1kHz level audio signal)
2. Connect an AC milli-voltmeter to the AUDIO OUT jack.
3. Make sure that the output level is value shown in table.

CHECKING OF AUDIO RECORD LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Record/playback
Input signal	1kHz, – 8.0dB (at RCA type jack) 1kHz, – 3.8dB (at 21 pin type jack)
Test point	AUDIO OUT jack
Specification	– 8.0 ± 3dB (at RCA type jack) – 3.8 ± 3dB (at 21 pin type jack)

1. Connect an oscilloscope to the AUDIO OUT jack.
2. Feed the audio signal shown in table to the AUDIO IN jack.
3. Make the self-recording and playback of the signal.
4. Make sure that the output level is value shown in table.
   If it is out of specified value, verify the bias current (ADJUSTMENT OF AUDIO BIAS CURRENT below).

ADJUSTMENT OF AUDIO BIAS CURRENT

Measuring instrument	AC milli-voltmeter
Mode	Record
Input signal	Not required
Test point	TP601 (+)~TP602 (–)
Control	R634 Bias current control
Specification	2.5 ± 0.1mVrms.

1. Connect an AC milli-voltmeter to TP601 (+) and TP602 (–).
   (Use TP602 for ground lead.)
2. Put the unit in recording mode.
3. Adjust R634 so that the AC milli-voltmeter read is 2.5 ± 0.1mVrms.

CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T601
Specification	70 ± 5kHz,40Vp-p or greater.

1. Put the unit in record mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is 70 ± 5kHz.

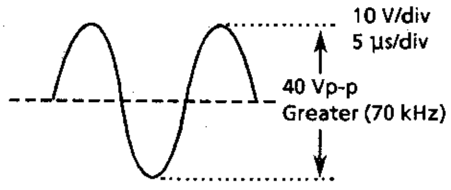


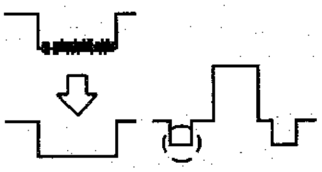
Figure 5-7.

RF CIRCUIT

ADJUSTMENT OF RF AGC CIRCUIT (EXCEPT G/S/H Version PLL MODELS)

Measuring instrument	Oscilloscope
Mode	Good TV Commercial broadcast reception
Test point	TP1502 (Sig.), TP1501 (GND)
Control	VR001 AGC control
Specification	Just before shrinking (See of Figure 5-8.)

1. Have the unit received good TV commercial broadcast reception.
   (Input field strength: 80dBµV of antenna terminal.)
2. Connect an oscilloscope to test points TP1502 (Sig.) and TP1501 (GND).
3. Observe the video output terminal waveform on the oscilloscope.
   Adjust VR001 (AGC control) in the IF pack until the noise disappears from the oscilloscope screen and the waveform nearly comes into sync.



Just before shrinking

Figure 5-8.

ADJUSTMENT OF RF AGC CIRCUIT (G/S-Version ONLY)

Measuring instrument	DC voltmeter VHF signal generator
Mode	RF signal at E12-CH (by VHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1503 (+), TP1501 (–)
Control	VR001 AGC control
Specification	4.5 ± 0.1V (When the tuner make use of VTUVTSH6HZ50/) 4.5 ± 0.1V (When the tuner make use of VTUOF4EG-721F) 4.5 ± 0.1V (When the tuner make use of VTUOF4EG-721F)

1. Receive the E12 channel signal (colour bar signal at 87.5% modulated.) at input field strength: 70dBµV of antenna terminal.
2. Connect a DC voltmeter to test points TP1503 (+) and TP1501 (–).
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

ADJUSTMENT OF RF AGC CIRCUIT (H-Version ONLY)

Measuring instrument	DC voltmeter VHF signal generator
Mode	RF signal at E69-CH (by UHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1503 (+), TP1501 (–)
Control	VR001 AGC control
Specification	5.6 ± 0.1V (When the tuner make use of VTUOF4EK-721F)

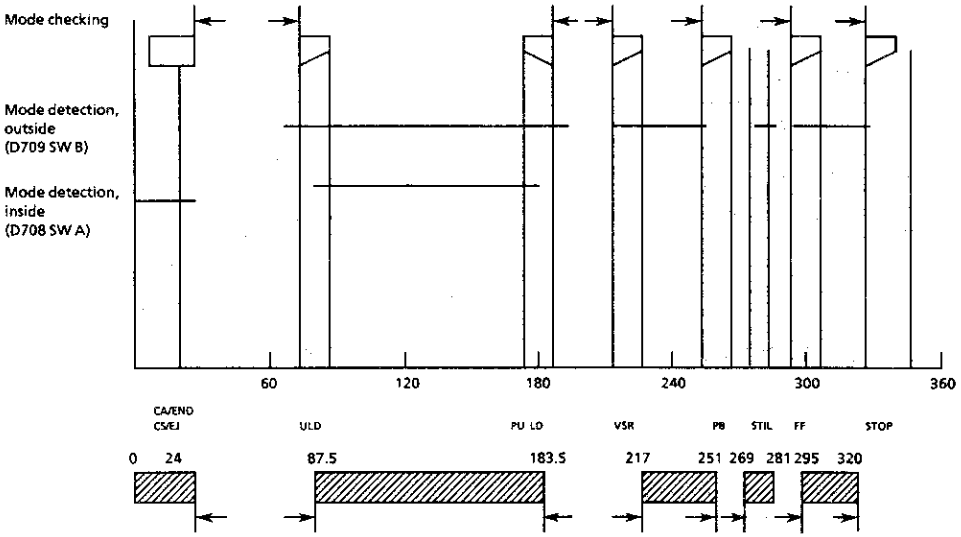
1. Receive the E69 channel signal (colour bar signal at 87.5% modulated.) at input field strength: 53dBµV of antenna terminal.
2. Connect a DC voltmeter to test points TP1503 (+) and TP1501 (–).
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

6. MECHANISM OPERATION FLOW CHART AND TROUBLESHOOTING GUIDE

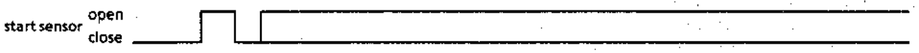
MECHANISM OPERATION FLOWCHART

* This flowchart describes the outline of the mechanism's operation, but does not give its details.

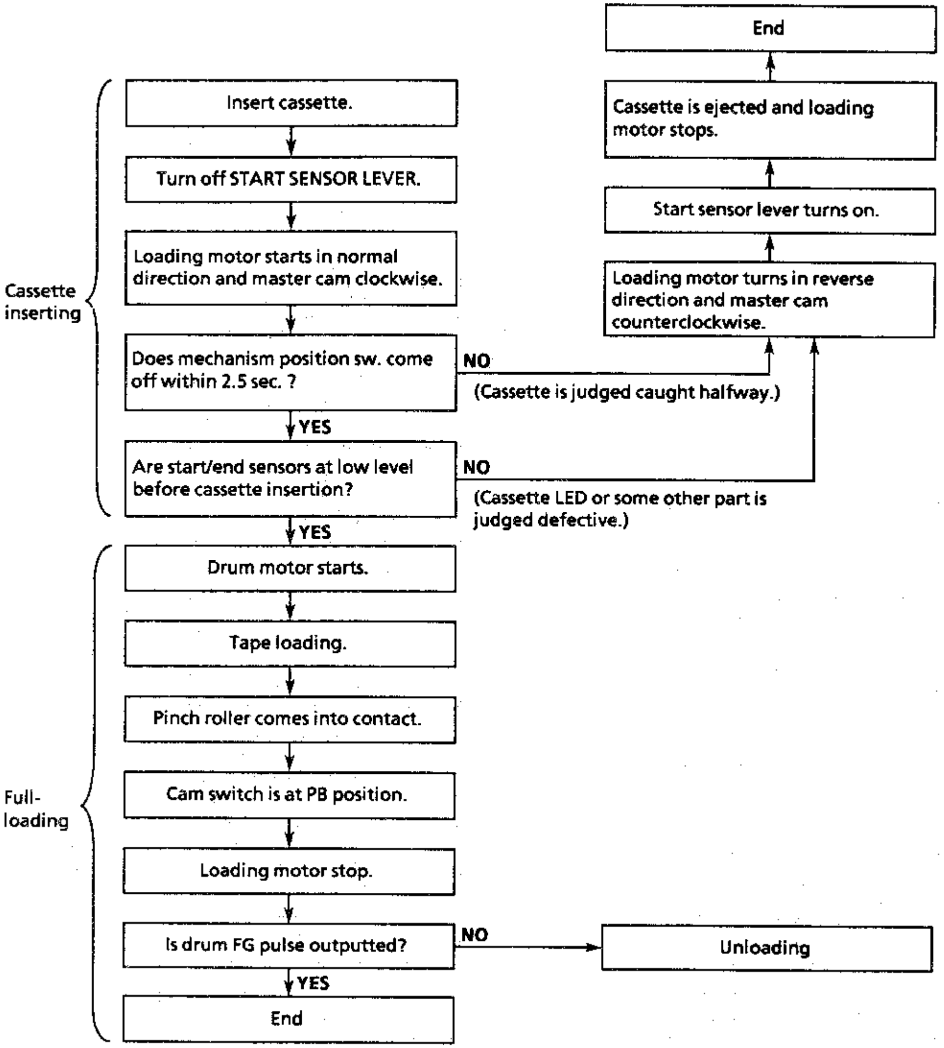
Cam movement chart



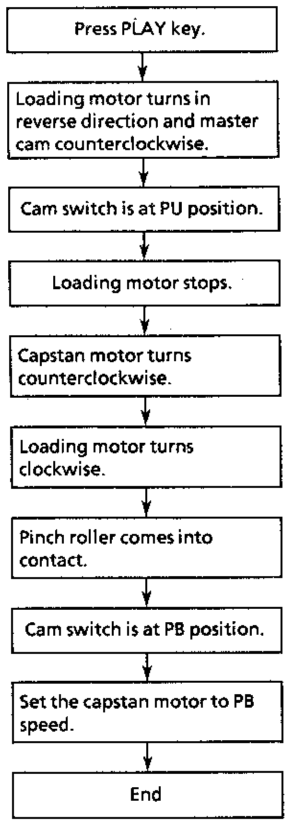
	CS/EJ						ULD	PU LD			VSR		PB	STL		FF		STOP
Mode detection, outside	0	0	0	0	0	1	1	1	1	0	1	1	0	1	0 0	1	1	0
Mode detection, inside	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0 0	0	0	0
S sensor	1	1	0	1	1 or 0													



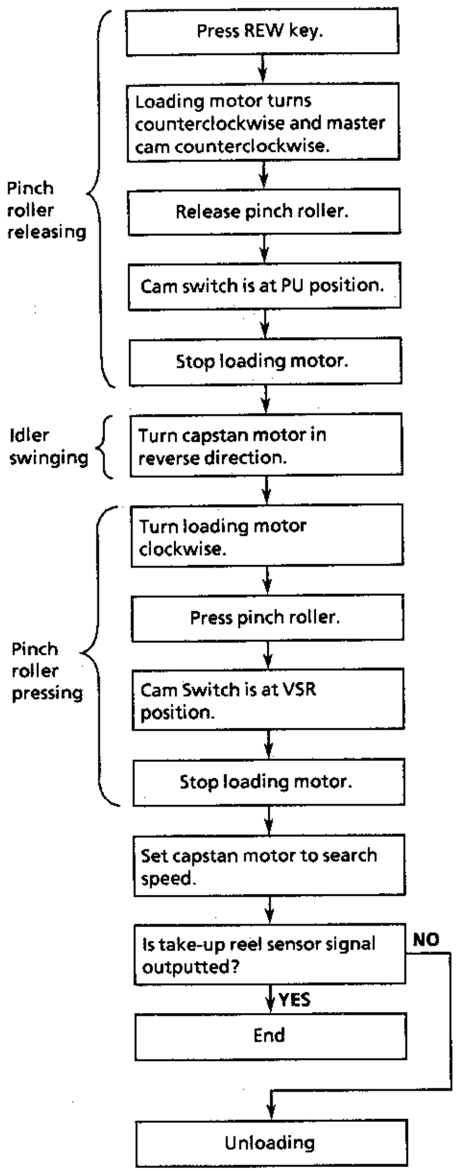
CASSETTE INSERTION → STOP


Cassette inserting
Insert cassette.
Turn off START SENSOR LEVER.
Loading motor starts in normal direction and master cam clockwise.
Does mechanism position sw. come off within 2.5 sec. ?
NO
(Cassette is judged caught halfway.)
YES
Are start/end sensors at low level before cassette insertion?
NO
(Cassette LED or some other part is judged defective.)
YES
Loading motor turns in reverse direction and master cam counterclockwise.
Start sensor lever turns on.
Cassette is ejected and loading motor stops.
End
Full-loading
Drum motor starts.
Tape loading.
Pinch roller comes into contact.
Cam switch is at PB position.
Loading motor stop.
Is drum FG pulse outputted?
NO
Unloading
YES
End

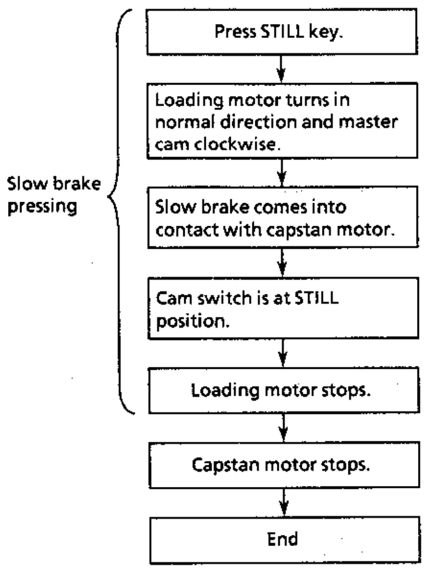
VSR → PLAY


Press PLAY key.
Loading motor turns in reverse direction and master cam counterclockwise.
Cam switch is at PU position.
Loading motor stops.
Capstan motor turns counterclockwise.
Loading motor turns clockwise.
Pinch roller comes into contact.
Cam switch is at PB position.
Set the capstan motor to PB speed.
End

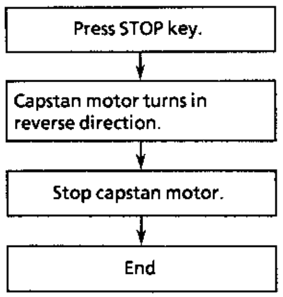
PLAY → VSR


Press REW key.
Loading motor turns counterclockwise and master cam counterclockwise.
Release pinch roller.
Cam switch is at PU position.
Stop loading motor.
Turn capstan motor in reverse direction.
Turn loading motor clockwise.
Press pinch roller.
Cam Switch is at VSR position.
Stop loading motor.
Set capstan motor to search speed.
Is take-up reel sensor signal outputted?
NO
YES
End
Unloading
Pinch roller releasing
Idler swinging
Pinch roller pressing

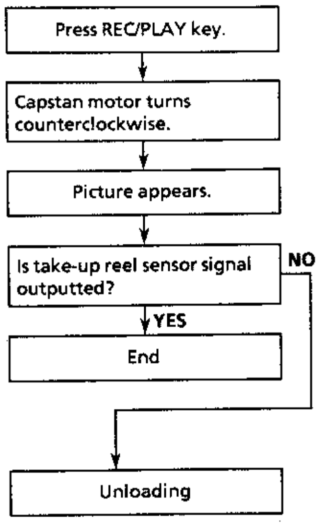
PLAY → STILL


Press STILL key.
Loading motor turns in normal direction and master cam clockwise.
Slow brake comes into contact with capstan motor.
Cam switch is at STILL position.
Loading motor stops.
Capstan motor stops.
End
Slow brake pressing

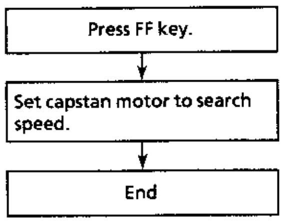
REC/PLAY → STOP


Press STOP key.
Capstan motor turns in reverse direction.
Stop capstan motor.
End

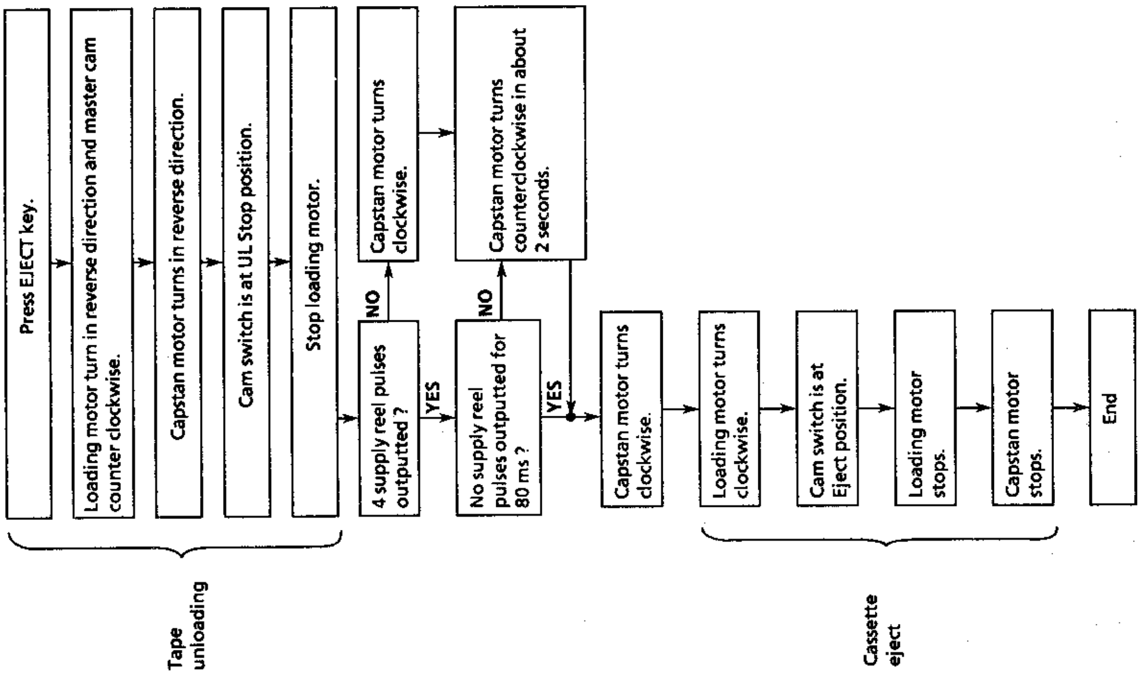
STOP → REC/PLAY


Press REC/PLAY key.
Capstan motor turns counterclockwise.
Picture appears.
Is take-up reel sensor signal outputted?
NO
YES
End
Unloading

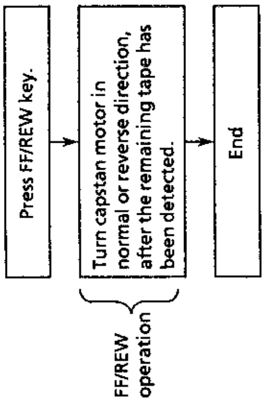
PLAY → VSF


Press FF key.
Set capstan motor to search speed.
End

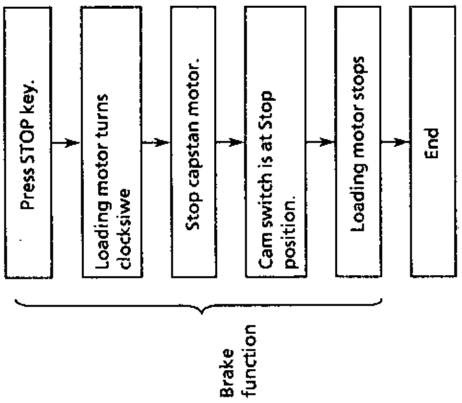
STOP →CASSETTE EJECT


Press EJECT key.
Loading motor turn in reverse direction and master cam counter clockwise.
Capstan motor turns in reverse direction.
Cam switch is at UL Stop position.
Stop loading motor.
4 supply reel pulses outputted ?
NO
Capstan motor turns clockwise.
YES
No supply reel pulses outputted for 80 ms ?
NO
Capstan motor turns counterclockwise in about 2 seconds.
YES
Capstan motor turns clockwise.
Loading motor turns clockwise.
Cam switch is at Eject position.
Loading motor stops.
Capstan motor stops.
End
Tape unloading
Cassette eject

STOP → FF/REW

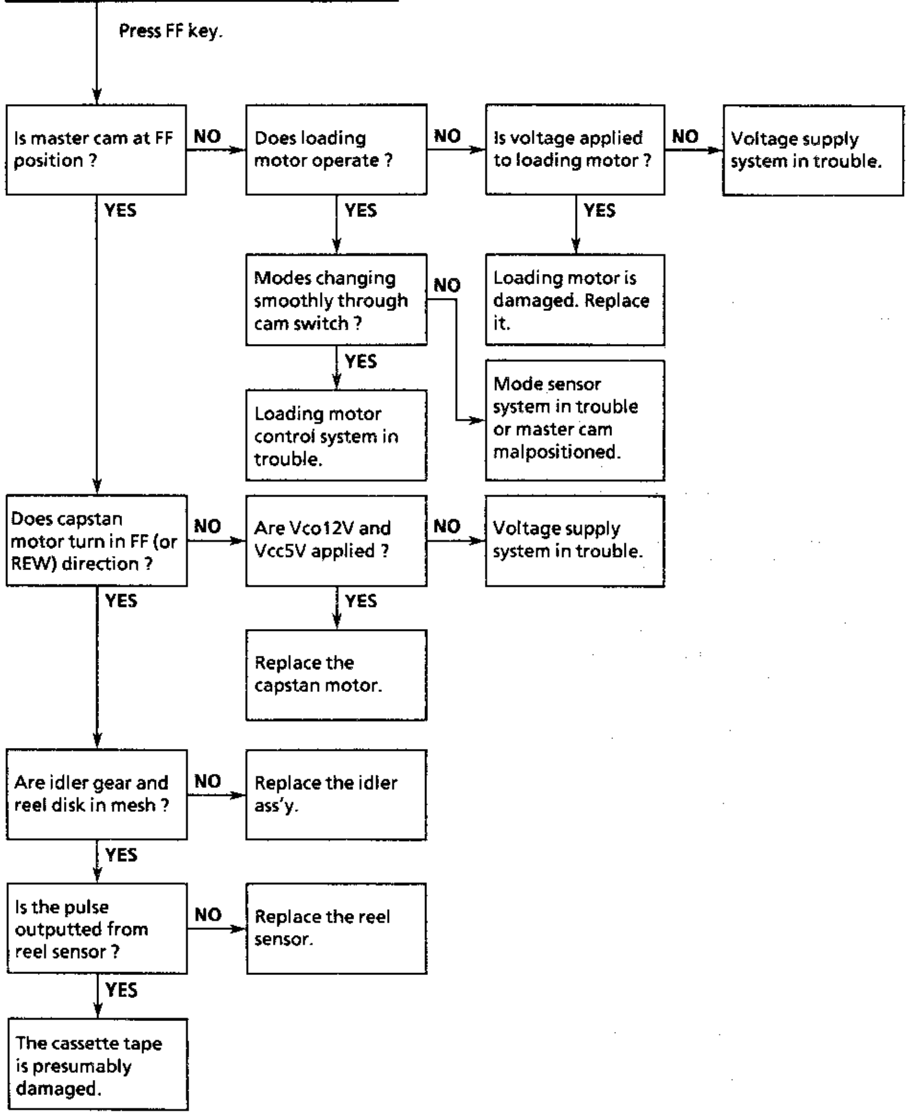

Press FF/REW key.
Turn capstan motor in normal or reverse direction, after the remaining tape has been detected.
End
FF/REW operation

FF/REW → STOP

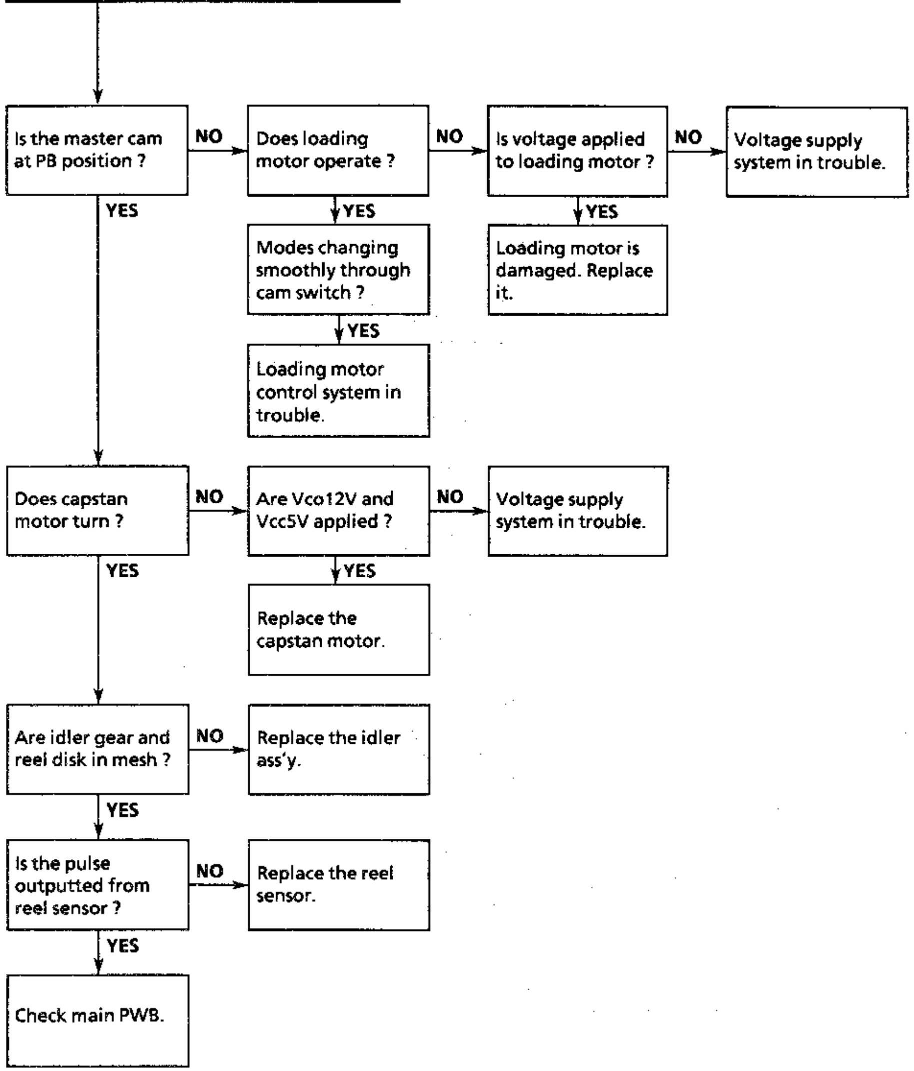

Press STOP key.
Loading motor turns clocksiwe
Stop capstan motor.
Cam switch is at Stop position.
Loading motor stops
End
Brake function

MECHANISM TROUBLESHOOTING

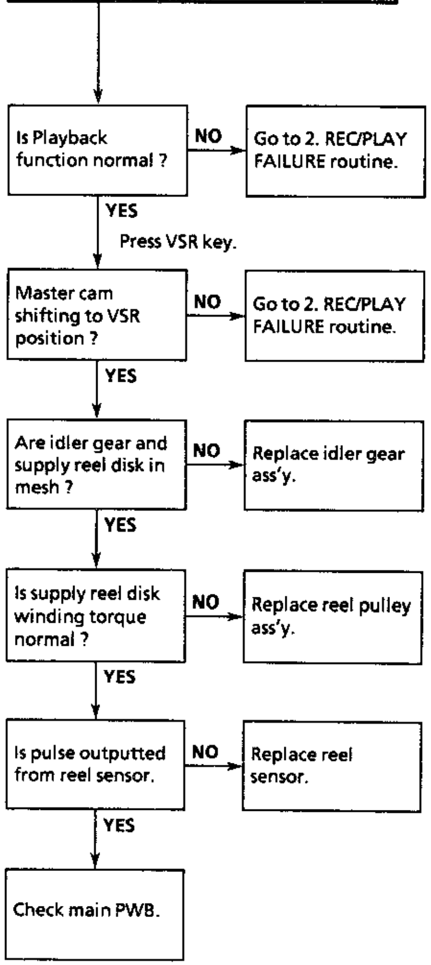
1. FF/REW FAILURE (NO TAPE WINDING)


Press FF key.
Is master cam at FF position ?
NO
Does loading motor operate ?
NO
Is voltage applied to loading motor ?
NO
Voltage supply system in trouble.
YES
Loading motor is damaged. Replace it.
YES
Modes changing smoothly through cam switch ?
NO
Mode sensor system in trouble or master cam malpositioned.
YES
Loading motor control system in trouble.
YES
Does capstan motor turn in FF (or REW) direction ?
NO
Are Vco12V and Vcc5V applied ?
NO
Voltage supply system in trouble.
YES
Replace the capstan motor.
YES
Are idler gear and reel disk in mesh ?
NO
Replace the idler ass'y.
YES
Is the pulse outputted from reel sensor ?
NO
Replace the reel sensor.
YES
The cassette tape is presumably damaged.

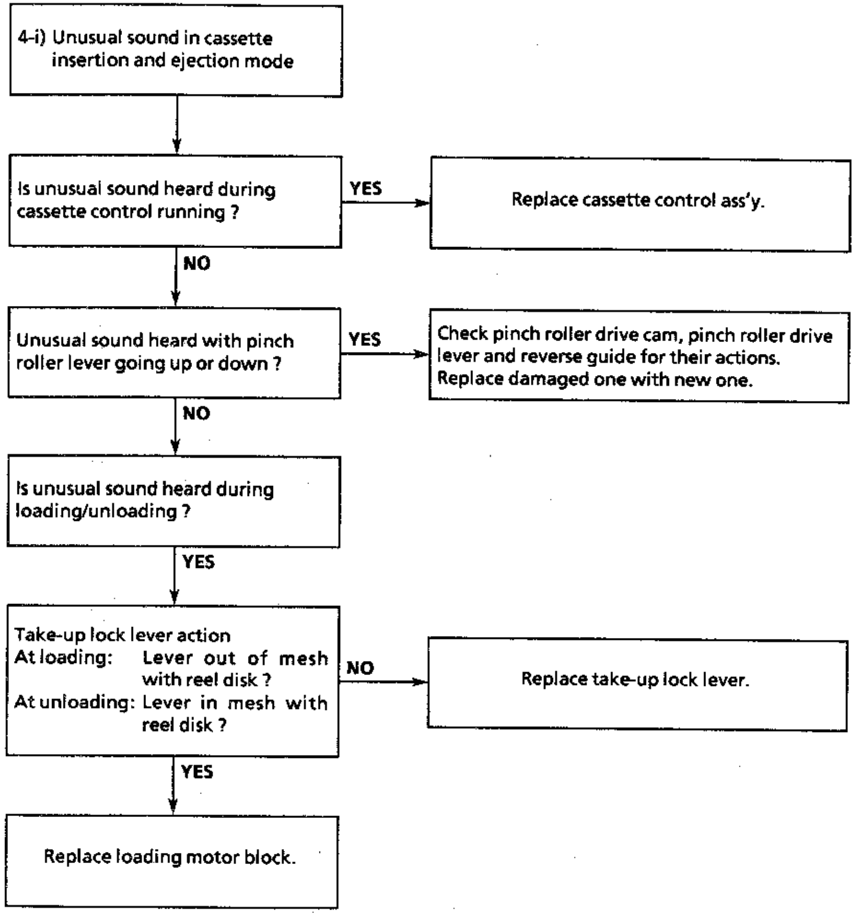
2. REC/PLAY FAILURE (MODE RELEASE)

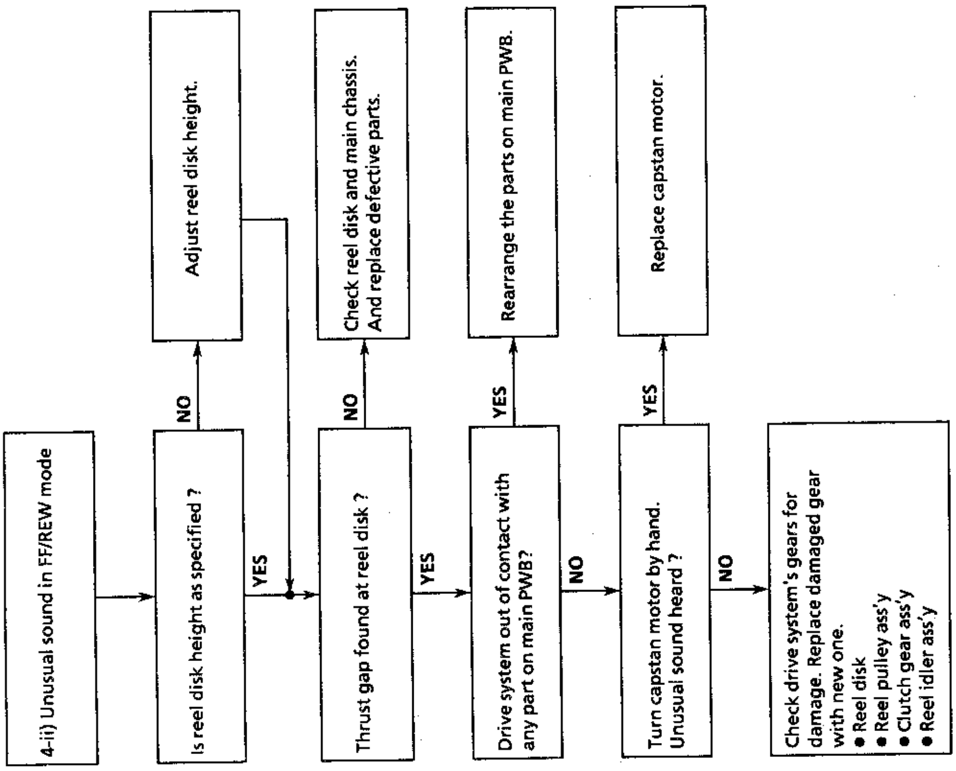

Is the master cam at PB position ?
NO
Does loading motor operate ?
NO
Is voltage applied to loading motor ?
NO
Voltage supply system in trouble.
YES
Loading motor is damaged. Replace it.
YES
Modes changing smoothly through cam switch ?
YES
Loading motor control system in trouble.
YES
Does capstan motor turn ?
NO
Are Vco12V and Vcc5V applied ?
NO
Voltage supply system in trouble.
YES
Replace the capstan motor.
YES
Are idler gear and reel disk in mesh ?
NO
Replace the idler ass'y.
YES
Is the pulse outputted from reel sensor ?
NO
Replace the reel sensor.
YES
Check main PWB.

3. WINDING FAILURE AT VSR


Is Playback function normal ?
NO
Go to 2. REC/PLAY FAILURE routine.
YES
Press VSR key.
Master cam shifting to VSR position ?
NO
Go to 2. REC/PLAY FAILURE routine.
YES
Are idler gear and supply reel disk in mesh ?
NO
Replace idler gear ass'y.
YES
Is supply reel disk winding torque normal ?
NO
Replace reel pulley ass'y.
YES
Is pulse outputted from reel sensor.
NO
Replace reel sensor.
YES
Check main PWB.

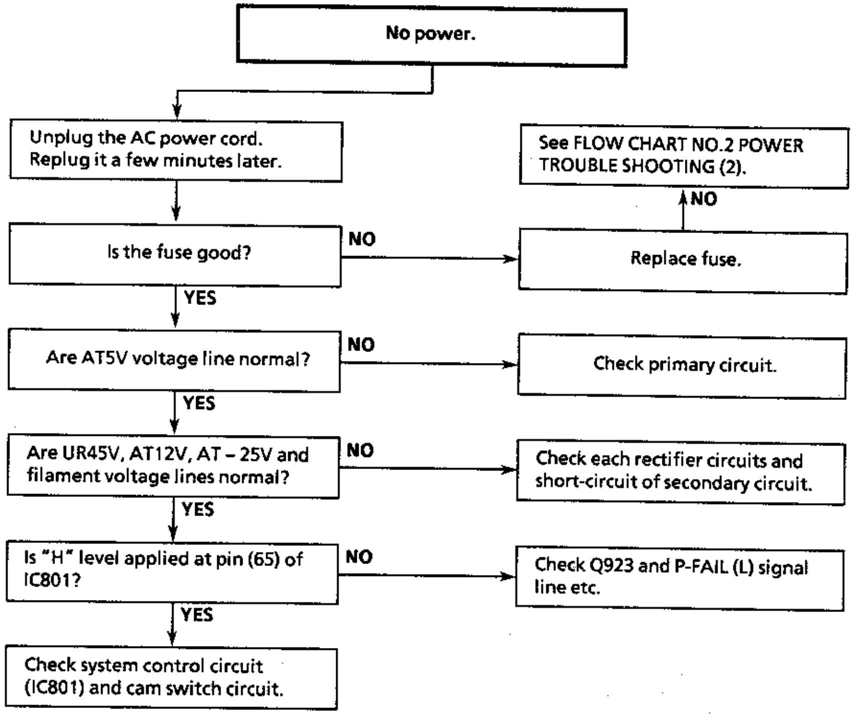
4. UNUSUAL SOUND IN EACH MODE


4-i) Unusual sound in cassette insertion and ejection mode
Is unusual sound heard during cassette control running ?
YES
Replace cassette control ass'y.
NO
Unusual sound heard with pinch roller lever going up or down ?
YES
Check pinch roller drive cam, pinch roller drive lever and reverse guide for their actions. Replace damaged one with new one.
NO
Is unusual sound heard during loading/unloading ?
YES
Take-up lock lever action
At loading: Lever out of mesh with reel disk ?
At unloading: Lever in mesh with reel disk ?
NO
Replace take-up lock lever.
YES
Replace loading motor block.

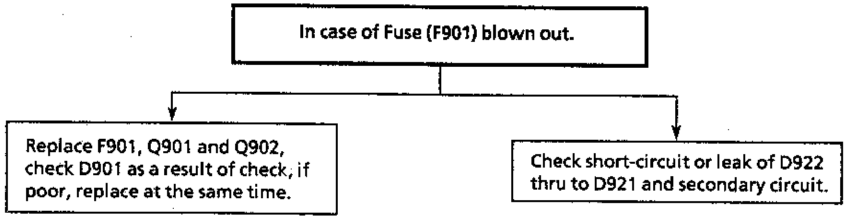

4-ii) Unusual sound in FF/REW mode
Is reel disk height as specified ?
NO
Adjust reel disk height.
YES
Thrust gap found at reel disk ?
NO
Check reel disk and main chassis. And replace defective parts.
YES
Drive system out of contact with any part on main PWB?
YES
Rearrange the parts on main PWB.
NO
Turn capstan motor by hand. Unusual sound heard ?
YES
Replace capstan motor.
NO
Check drive system's gears for damage. Replace damaged gear with new one.
● Reel disk
● Reel pulley ass'y
● Clutch gear ass'y
● Reel idler ass'y

7. TROUBLESHOOTING

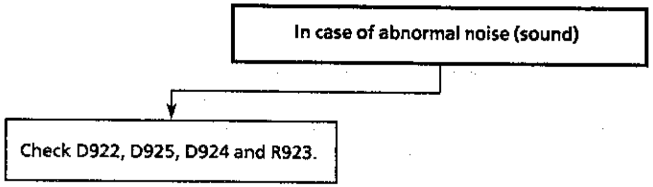
FLOW CHART NO.1 POWER TROUBLESHOOTING (1)


No power.
Unplug the AC power cord. Replug it a few minutes later.
Is the fuse good?
NO
Replace fuse.
NO
See FLOW CHART NO.2 POWER TROUBLE SHOOTING (2).
YES
Are AT5V voltage line normal?
NO
Check primary circuit.
YES
Are UR45V, AT12V, AT – 25V and filament voltage lines normal?
NO
Check each rectifier circuits and short-circuit of secondary circuit.
YES
Is "H" level applied at pin (65) of IC801?
NO
Check Q923 and P-FAIL (L) signal line etc.
YES
Check system control circuit (IC801) and cam switch circuit.

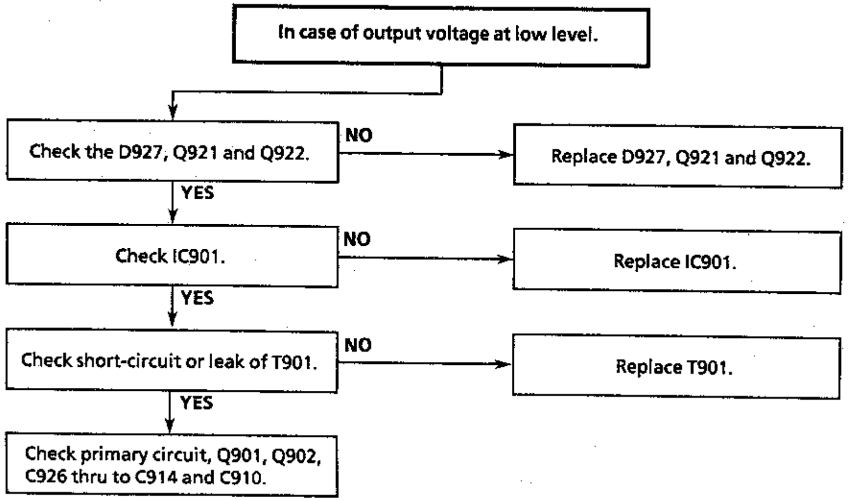
FLOW CHART NO.2 POWER TROUBLESHOOTING (2)


In case of Fuse (F901) blown out.
Replace F901, Q901 and Q902, check D901 as a result of check, if poor, replace at the same time.
Check short-circuit or leak of D922 thru to D921 and secondary circuit.

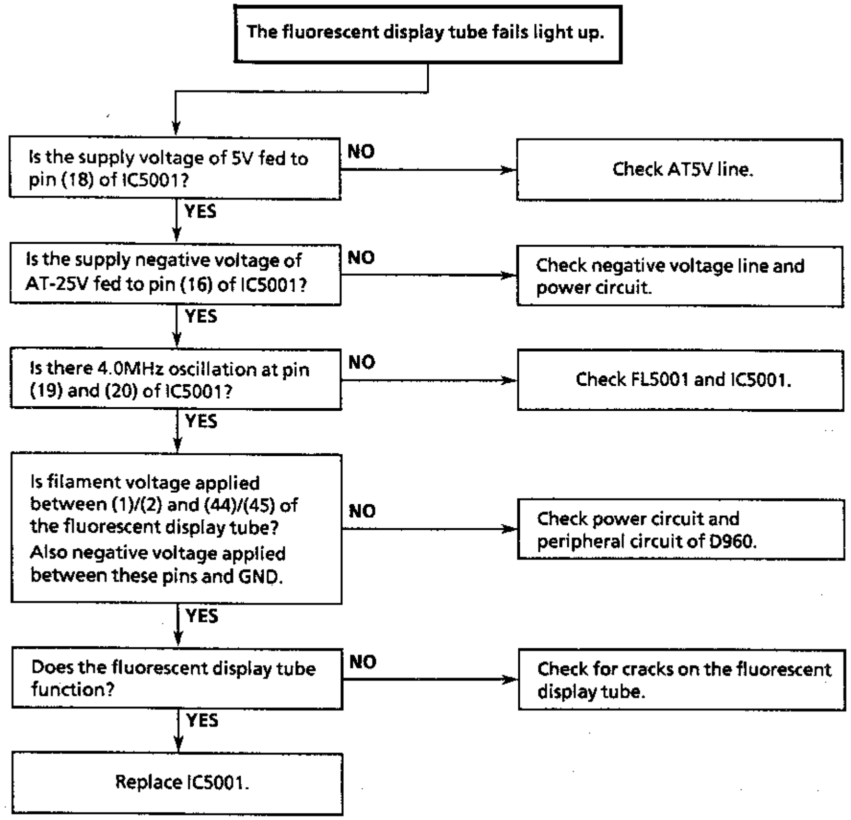
FLOW CHART NO.3 POWER TROUBLESHOOTING (3)


In case of abnormal noise (sound)
Check D922, D925, D924 and R923.

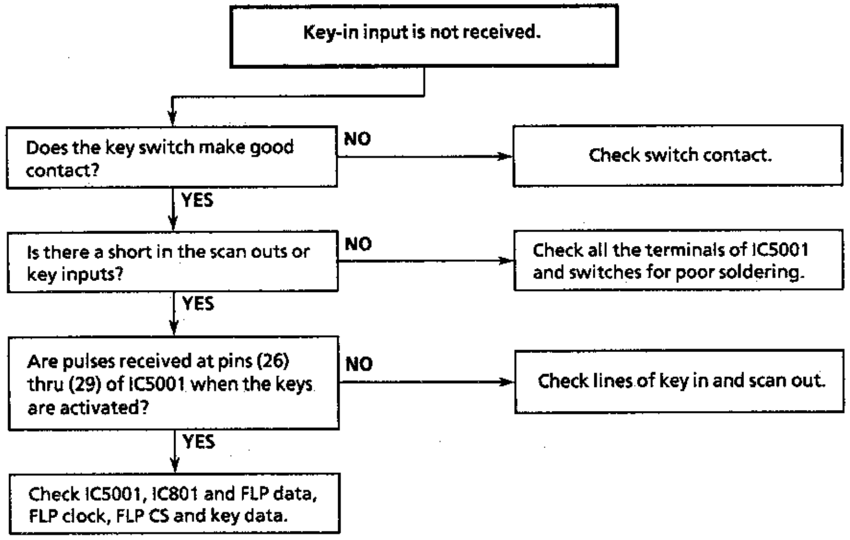
FLOW CHART NO.4 POWER TROUBLESHOOTING (4)


In case of output voltage at low level.
Check the D927, Q921 and Q922.
NO
Replace D927, Q921 and Q922.
YES
Check IC901.
NO
Replace IC901.
YES
Check short-circuit or leak of T901.
NO
Replace T901.
YES
Check primary circuit, Q901, Q902, C926 thru to C914 and C910.

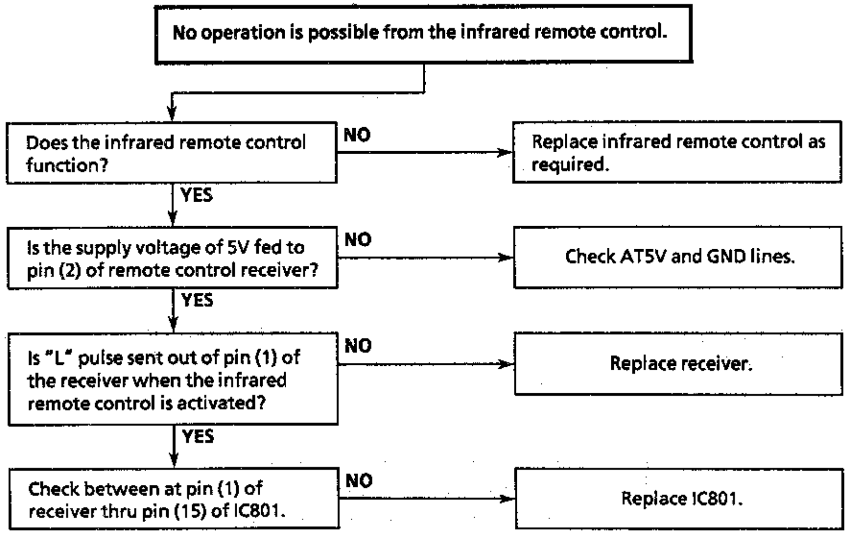
FLOW CHART NO.5 TIMER (1) TROUBLESHOOTING


The fluorescent display tube fails light up.
Is the supply voltage of 5V fed to pin (18) of IC5001?
NO
Check AT5V line.
YES
Is the supply negative voltage of AT-25V fed to pin (16) of IC5001?
NO
Check negative voltage line and power circuit.
YES
Is there 4.0MHz oscillation at pin (19) and (20) of IC5001?
NO
Check FL5001 and IC5001.
YES
Is filament voltage applied between (1)/(2) and (44)/(45) of the fluorescent display tube? Also negative voltage applied between these pins and GND.
NO
Check power circuit and peripheral circuit of D960.
YES
Does the fluorescent display tube function?
NO
Check for cracks on the fluorescent display tube.
YES
Replace IC5001.

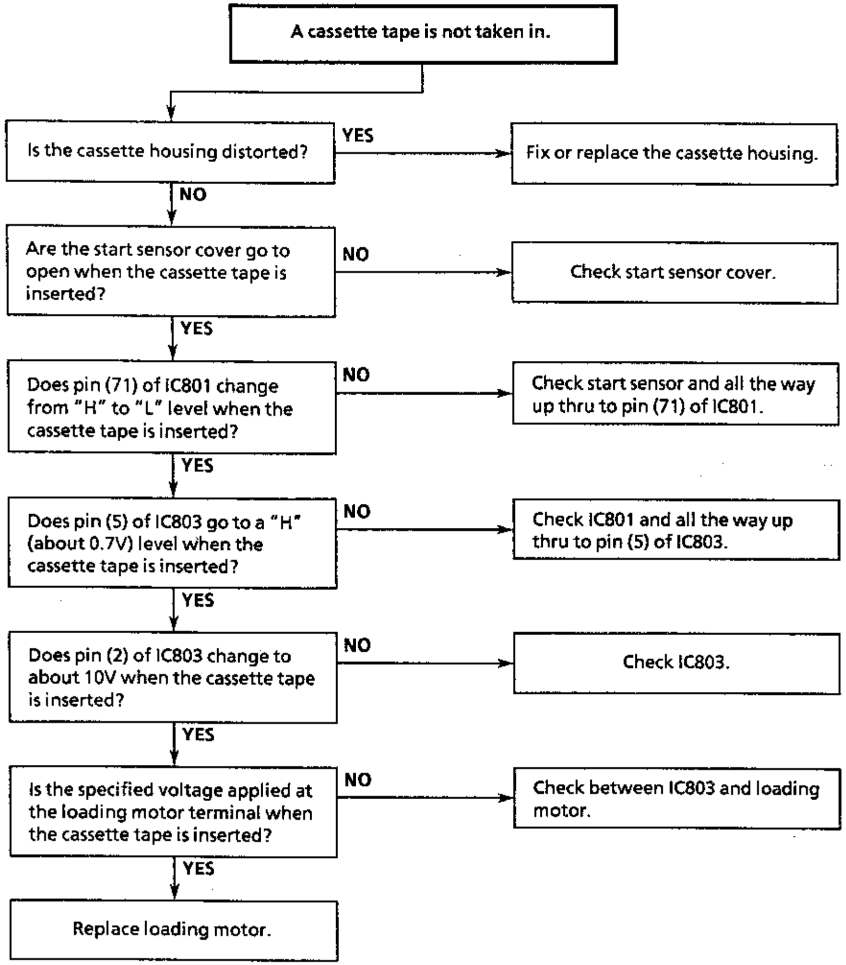
FLOW CHART NO.6 TIMER (2) TROUBLESHOOTING


Key-in input is not received.
Does the key switch make good contact?
NO
Check switch contact.
YES
Is there a short in the scan outs or key inputs?
NO
Check all the terminals of IC5001 and switches for poor soldering.
YES
Are pulses received at pins (26) thru (29) of IC5001 when the keys are activated?
NO
Check lines of key in and scan out.
YES
Check IC5001, IC801 and FLP data, FLP clock, FLP CS and key data.

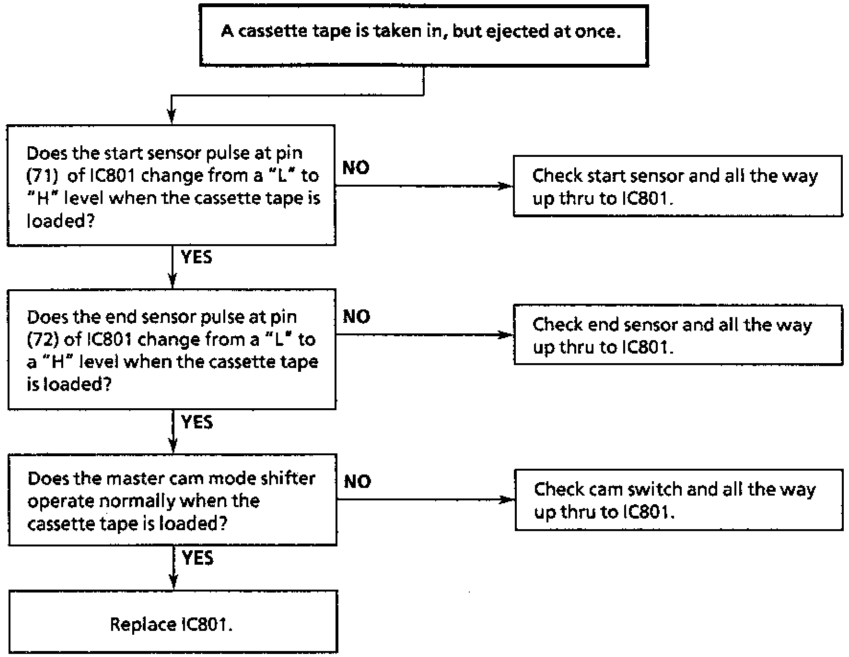
FLOW CHART NO.7 INFRARED R/C TROUBLESHOOTING


No operation is possible from the infrared remote control.
Does the infrared remote control function?
NO
Replace infrared remote control as required.
YES
Is the supply voltage of 5V fed to pin (2) of remote control receiver?
NO
Check AT5V and GND lines.
YES
Is "L" pulse sent out of pin (1) of the receiver when the infrared remote control is activated?
NO
Replace receiver.
YES
Check between at pin (1) of receiver thru pin (15) of IC801.
NO
Replace IC801.

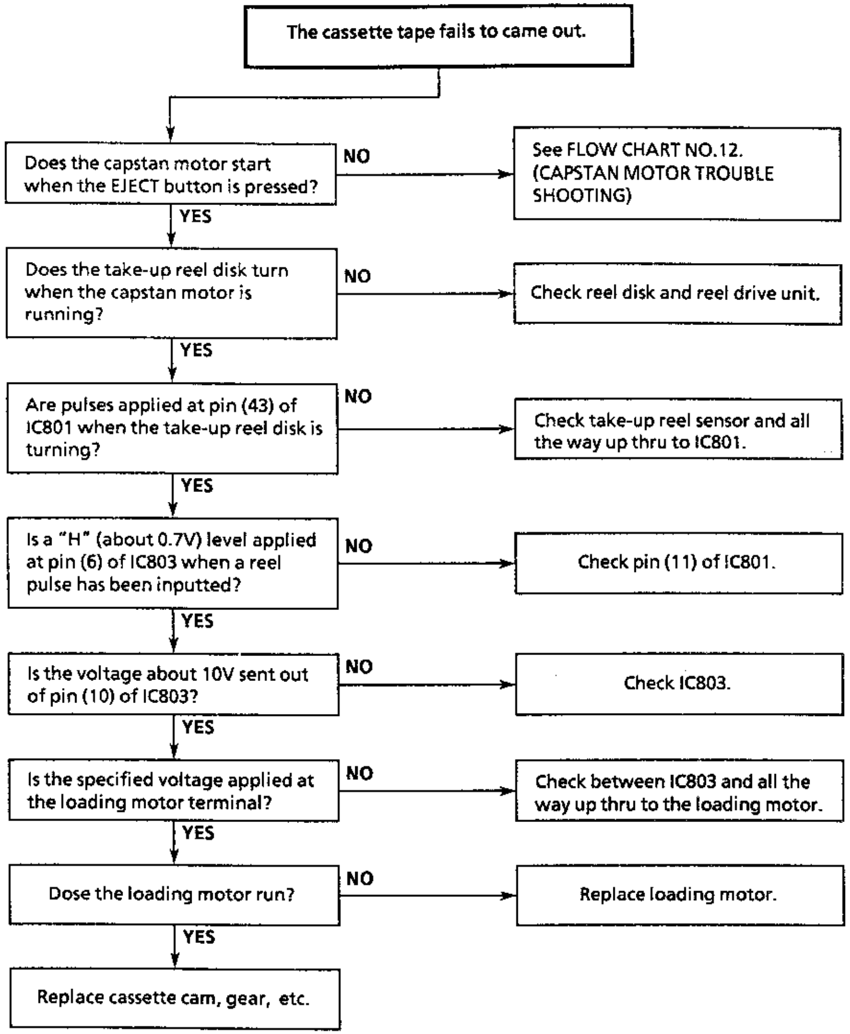
FLOW CHART NO.8 CASSETTE CONTROL TROUBLESHOOTING (1)


A cassette tape is not taken in.
Is the cassette housing distorted?
YES
Fix or replace the cassette housing.
NO
Are the start sensor cover go to open when the cassette tape is inserted?
NO
Check start sensor cover.
YES
Does pin (71) of IC801 change from "H" to "L" level when the cassette tape is inserted?
NO
Check start sensor and all the way up thru to pin (71) of IC801.
YES
Does pin (5) of IC803 go to a "H" (about 0.7V) level when the cassette tape is inserted?
NO
Check IC801 and all the way up thru to pin (5) of IC803.
YES
Does pin (2) of IC803 change to about 10V when the cassette tape is inserted?
NO
Check IC803.
YES
Is the specified voltage applied at the loading motor terminal when the cassette tape is inserted?
NO
Check between IC803 and loading motor.
YES
Replace loading motor.

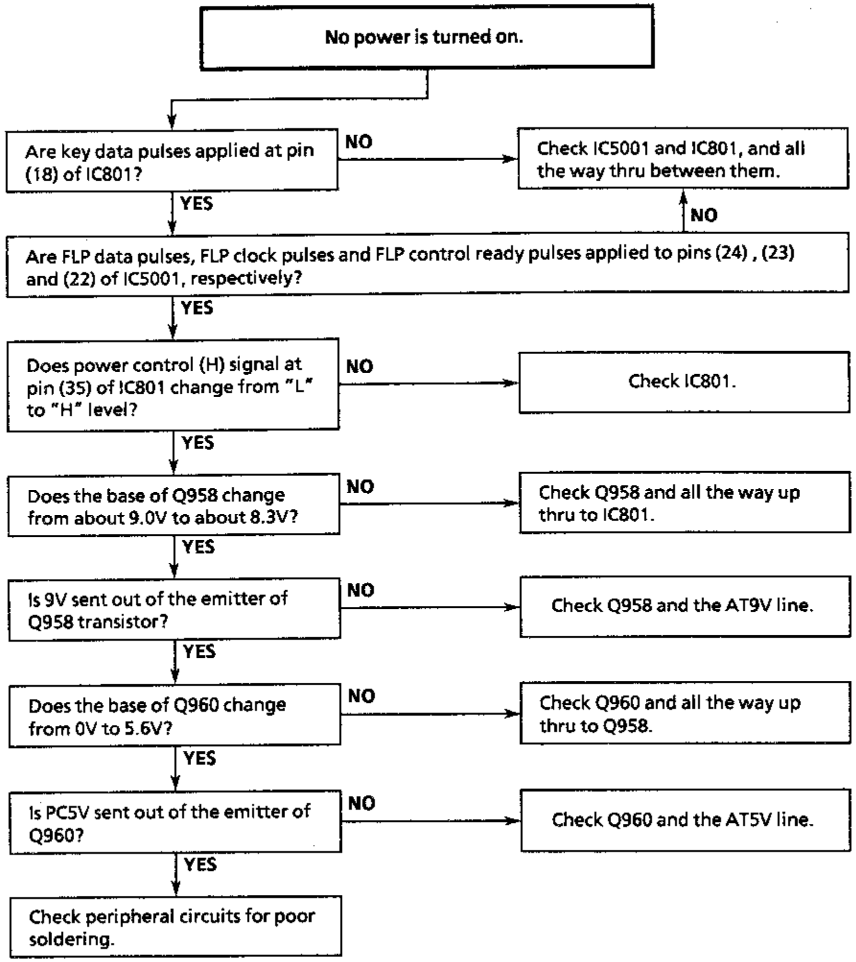
FLOW CHART NO.9 CASSETTE CONTROL TROUBLESHOOTING (2)


A cassette tape is taken in, but ejected at once.
Does the start sensor pulse at pin (71) of IC801 change from a "L" to "H" level when the cassette tape is loaded?
NO
Check start sensor and all the way up thru to IC801.
YES
Does the end sensor pulse at pin (72) of IC801 change from a "L" to a "H" level when the cassette tape is loaded?
NO
Check end sensor and all the way up thru to IC801.
YES
Does the master cam mode shifter operate normally when the cassette tape is loaded?
NO
Check cam switch and all the way up thru to IC801.
YES
Replace IC801.

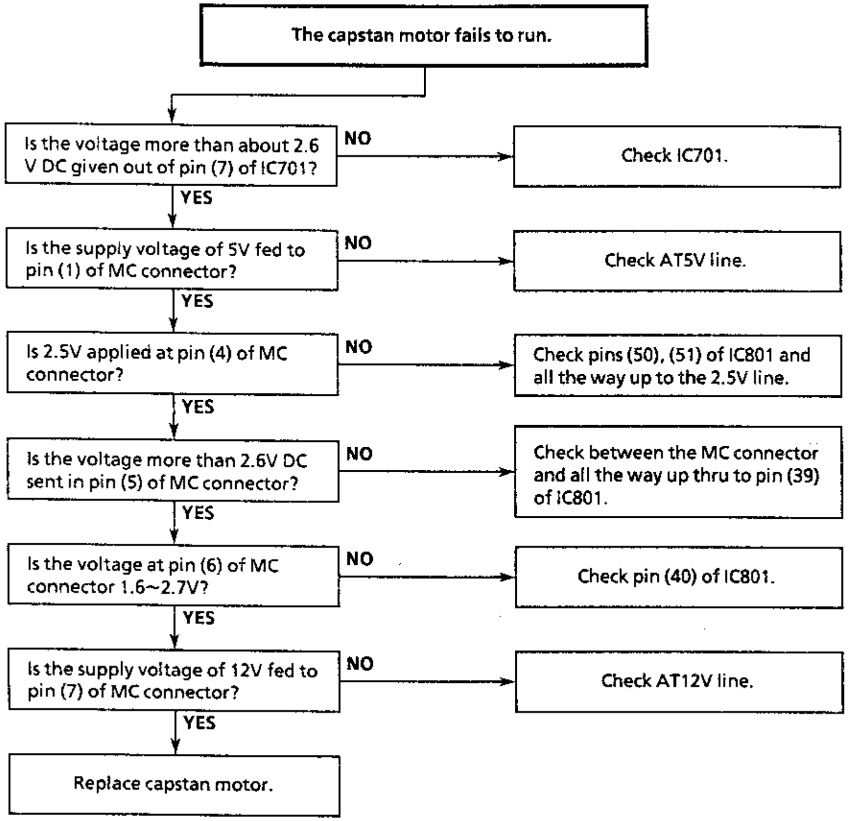
FLOW CHART NO.10 LOADING MOTOR AND EJECT TROUBLESHOOTING


The cassette tape fails to came out.
Does the capstan motor start when the EJECT button is pressed?
NO
See FLOW CHART NO.12. (CAPSTAN MOTOR TROUBLE SHOOTING)
YES
Does the take-up reel disk turn when the capstan motor is running?
NO
Check reel disk and reel drive unit.
YES
Are pulses applied at pin (43) of IC801 when the take-up reel disk is turning?
NO
Check take-up reel sensor and all the way up thru to IC801.
YES
Is a "H" (about 0.7V) level applied at pin (6) of IC803 when a reel pulse has been inputted?
NO
Check pin (11) of IC801.
YES
Is the voltage about 10V sent out of pin (10) of IC803?
NO
Check IC803.
YES
Is the specified voltage applied at the loading motor terminal?
NO
Check between IC803 and all the way up thru to the loading motor.
YES
Dose the loading motor run?
NO
Replace loading motor.
YES
Replace cassette cam, gear, etc.

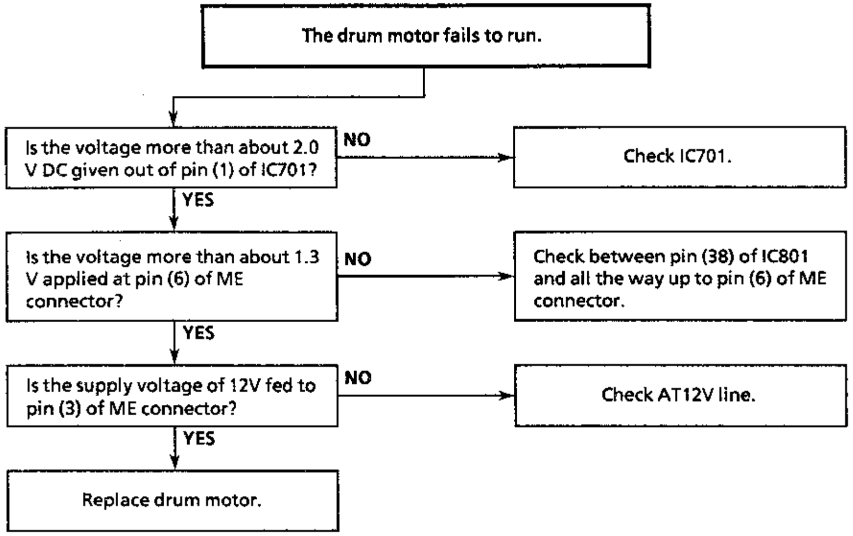
FLOW CHART NO.11 SYSTEM CONTROL TROUBLESHOOTING


No power is turned on.
Are key data pulses applied at pin (18) of IC801?
NO
Check IC5001 and IC801, and all the way thru between them.
YES
Are FLP data pulses, FLP clock pulses and FLP control ready pulses applied to pins (24), (23) and (22) of IC5001, respectively?
NO
YES
Does power control (H) signal at pin (35) of IC801 change from "L" to "H" level?
NO
Check IC801.
YES
Does the base of Q958 change from about 9.0V to about 8.3V?
NO
Check Q958 and all the way up thru to IC801.
YES
Is 9V sent out of the emitter of Q958 transistor?
NO
Check Q958 and the AT9V line.
YES
Does the base of Q960 change from 0V to 5.6V?
NO
Check Q960 and all the way up thru to Q958.
YES
Is PC5V sent out of the emitter of Q960?
NO
Check Q960 and the AT5V line.
YES
Check peripheral circuits for poor soldering.

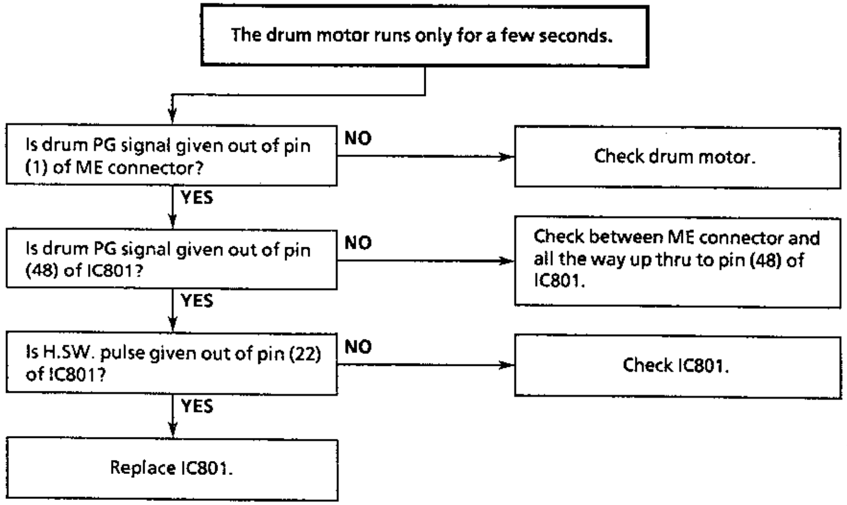
FLOW CHART NO.12 CAPSTAN MOTOR TROUBLESHOOTING


The capstan motor fails to run.
Is the voltage more than about 2.6 V DC given out of pin (7) of IC701?
NO
Check IC701.
YES
Is the supply voltage of 5V fed to pin (1) of MC connector?
NO
Check AT5V line.
YES
Is 2.5V applied at pin (4) of MC connector?
NO
Check pins (50), (51) of IC801 and all the way up to the 2.5V line.
YES
Is the voltage more than 2.6V DC sent in pin (5) of MC connector?
NO
Check between the MC connector and all the way up thru to pin (39) of IC801.
YES
Is the voltage at pin (6) of MC connector 1.6~2.7V?
NO
Check pin (40) of IC801.
YES
Is the supply voltage of 12V fed to pin (7) of MC connector?
NO
Check AT12V line.
YES
Replace capstan motor.

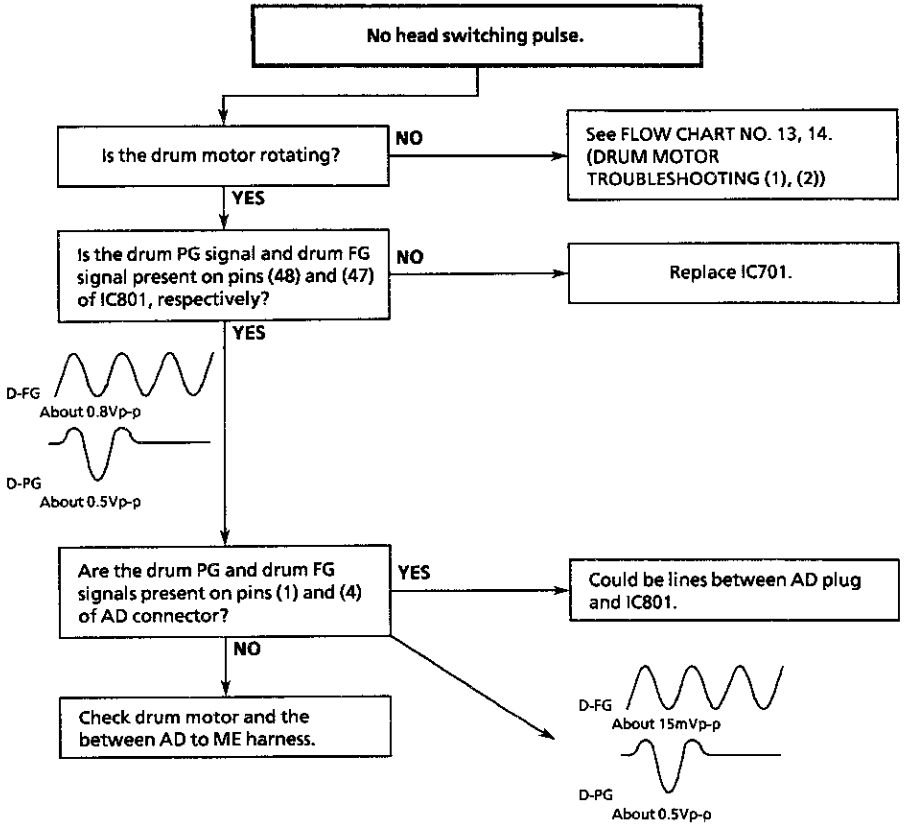
FLOW CHART NO.13 DRUM MOTOR TROUBLESHOOTING (1)


The drum motor fails to run.
Is the voltage more than about 2.0 V DC given out of pin (1) of IC701?
NO
Check IC701.
YES
Is the voltage more than about 1.3 V applied at pin (6) of ME connector?
NO
Check between pin (38) of IC801 and all the way up to pin (6) of ME connector.
YES
Is the supply voltage of 12V fed to pin (3) of ME connector?
NO
Check AT12V line.
YES
Replace drum motor.

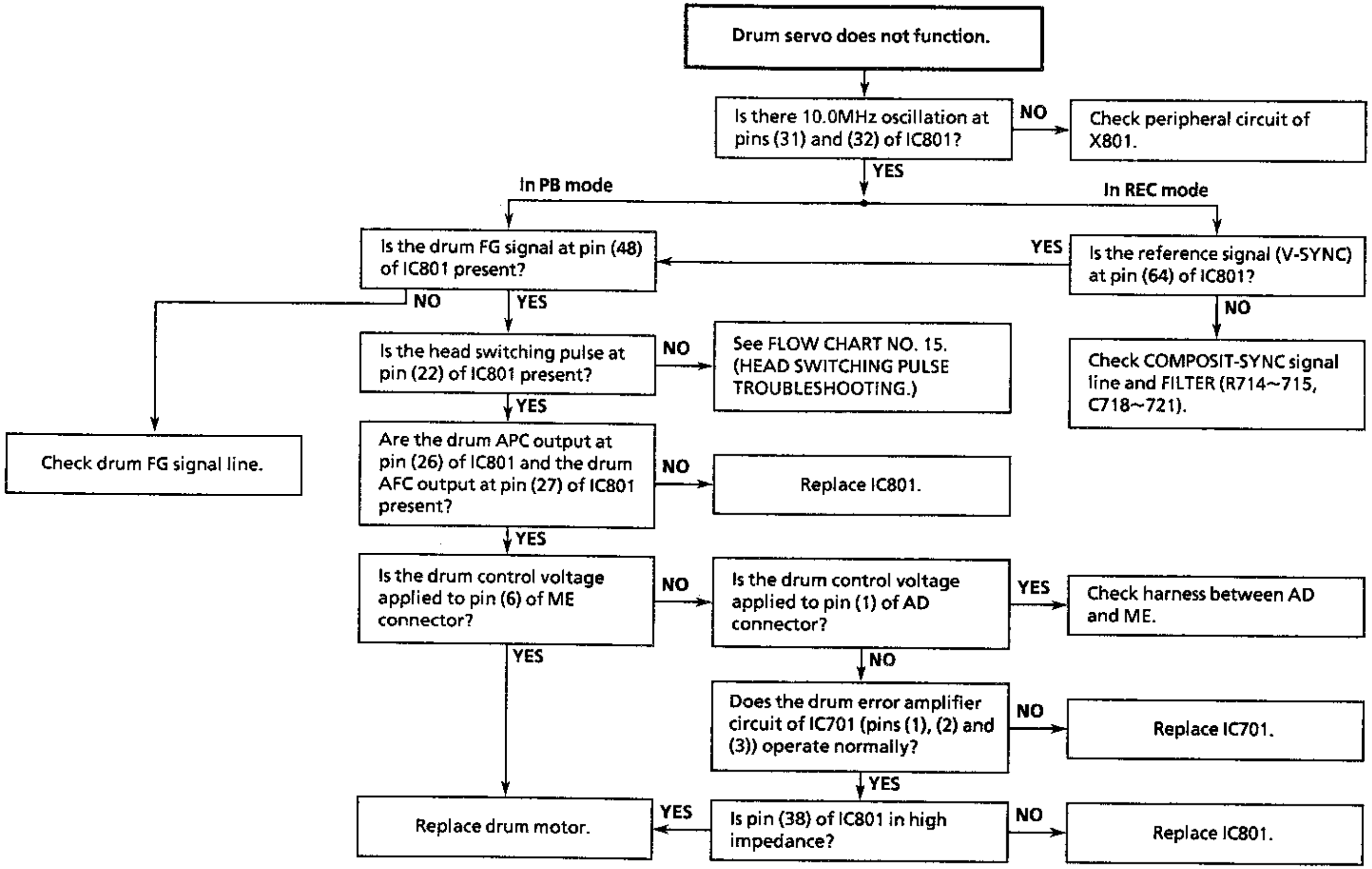
FLOW CHART NO.14 DRUM MOTOR TROUBLESHOOTING (2)


The drum motor runs only for a few seconds.
Is drum PG signal given out of pin (1) of ME connector?
NO
Check drum motor.
YES
Is drum PG signal given out of pin (48) of IC801?
NO
Check between ME connector and all the way up thru to pin (48) of IC801.
YES
Is H.SW. pulse given out of pin (22) of IC801?
NO
Check IC801.
YES
Replace IC801.

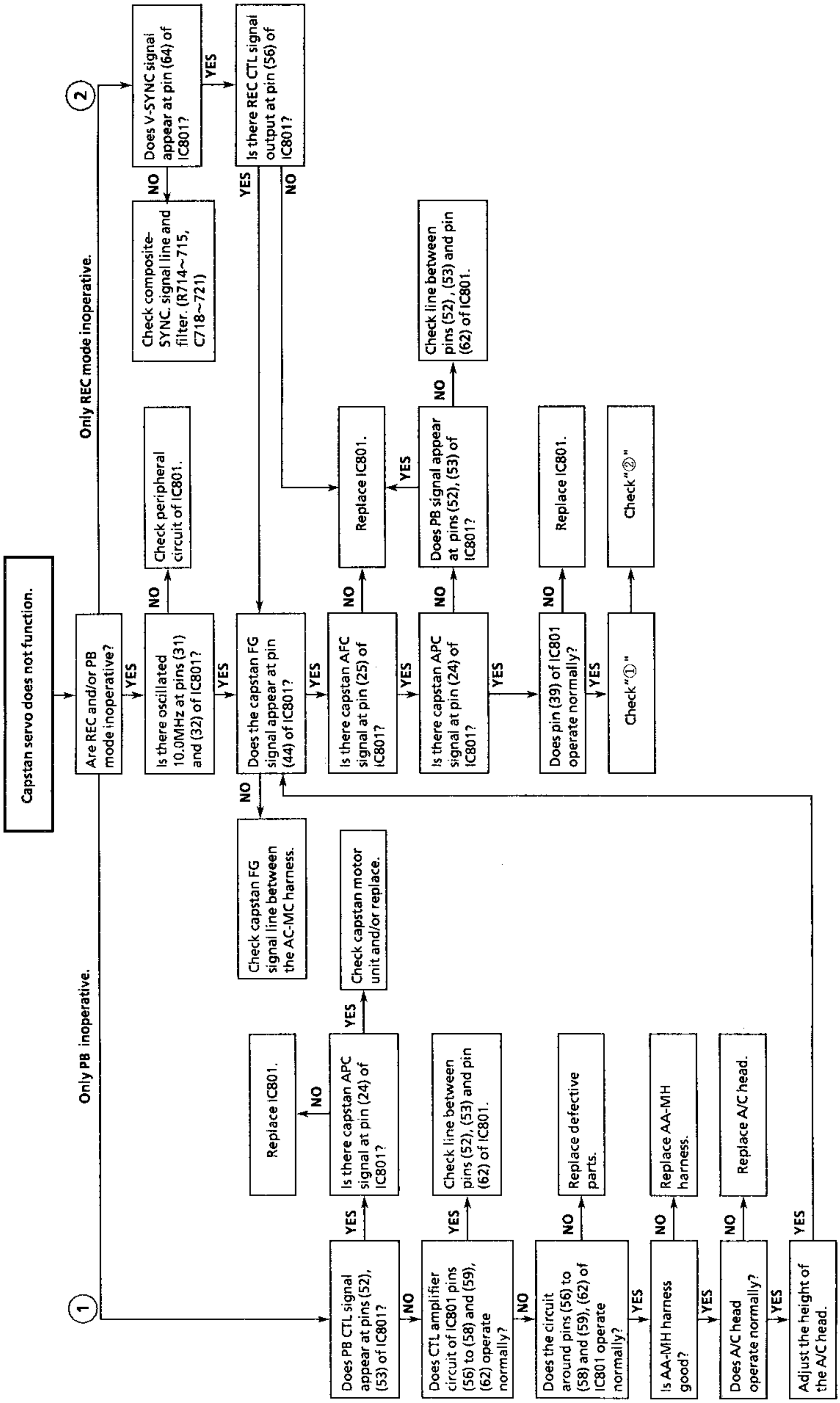
FLOW CHART NO.15 HEAD SWITCHING PULSE TROUBLESHOOTING


No head switching pulse.
Is the drum motor rotating?
NO
See FLOW CHART NO. 13, 14. (DRUM MOTOR TROUBLESHOOTING (1), (2))
YES
Is the drum PG signal and drum FG signal present on pins (48) and (47) of IC801, respectively?
NO
Replace IC701.
YES
D-FG
About 0.8Vp-p
D-PG
About 0.5Vp-p
Are the drum PG and drum FG signals present on pins (1) and (4) of AD connector?
YES
Could be lines between AD plug and IC801.
D-FG
About 15mVp-p
D-PG
About 0.5Vp-p
NO
Check drum motor and the between AD to ME harness.

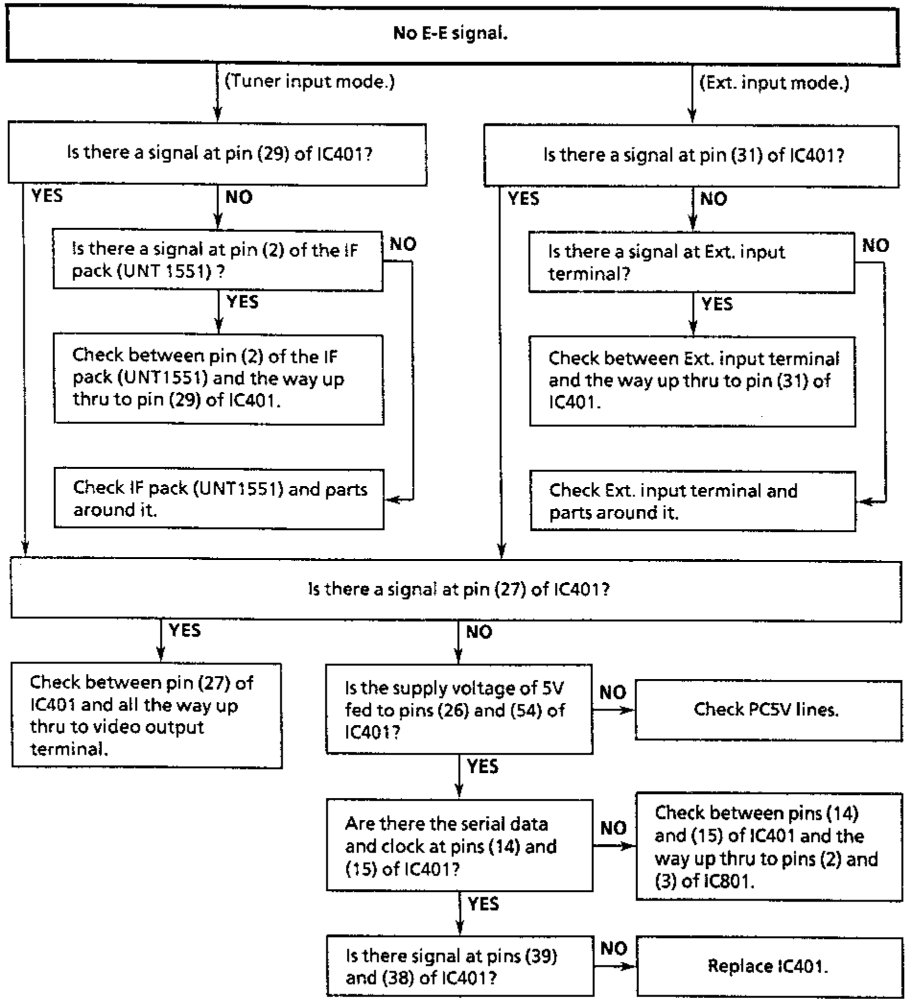
FLOW CHART NO.16 DRUM SERVO TROUBLESHOOTING


Drum servo does not function.
Is there 10.0MHz oscillation at pins (31) and (32) of IC801?
NO
Check peripheral circuit of X801.
YES
In PB mode
In REC mode
Is the reference signal (V-SYNC) at pin (64) of IC801?
YES
NO
Check COMPOSIT-SYNC signal line and FILTER (R714~715, C718~721).
Is the drum FG signal at pin (48) of IC801 present?
NO
Check drum FG signal line.
YES
Is the head switching pulse at pin (22) of IC801 present?
NO
See FLOW CHART NO. 15. (HEAD SWITCHING PULSE TROUBLESHOOTING.)
YES
Are the drum APC output at pin (26) of IC801 and the drum AFC output at pin (27) of IC801 present?
NO
Replace IC801.
YES
Is the drum control voltage applied to pin (6) of ME connector?
NO
Is the drum control voltage applied to pin (1) of AD connector?
YES
Check harness between AD and ME.
NO
Does the drum error amplifier circuit of IC701 (pins (1), (2) and (3)) operate normally?
NO
Replace IC701.
YES
Is pin (38) of IC801 in high impedance?
NO
Replace IC801.
YES
YES
Replace drum motor.

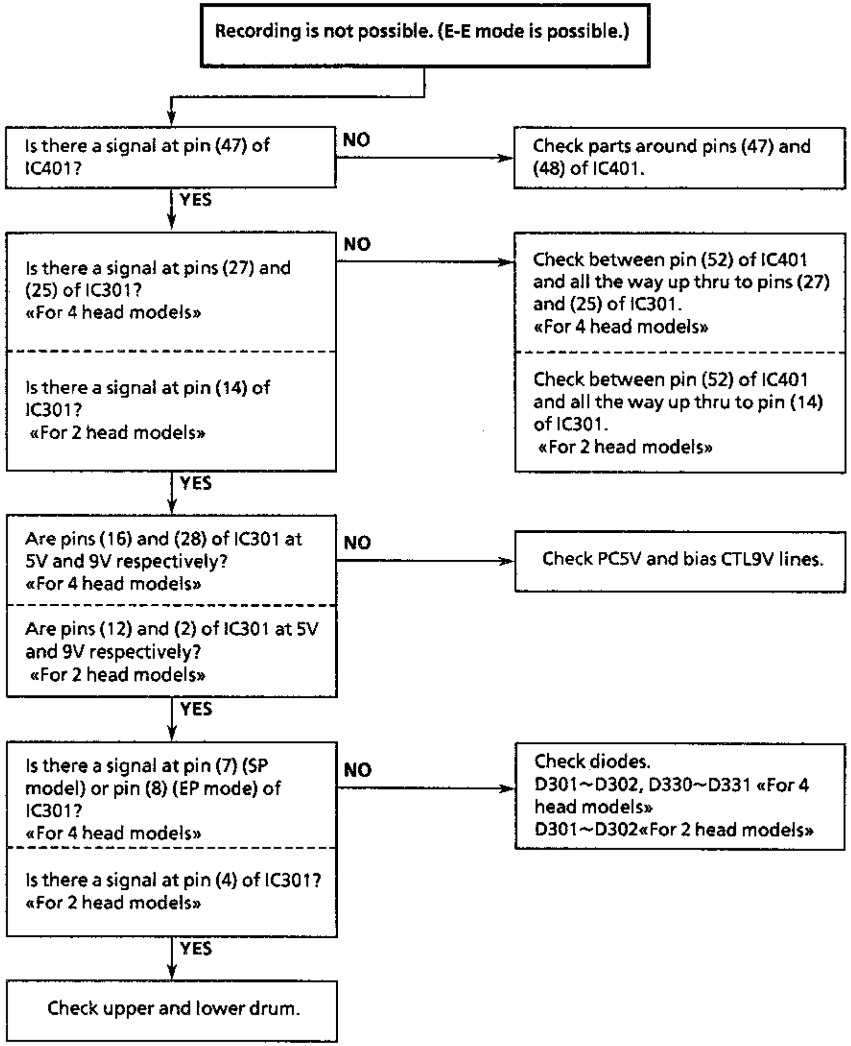
FLOW CHART NO.17 CAPSTAN SERVO TROUBLESHOOTING


Capstan servo does not function.
Are REC and/or PB mode inoperative?
YES
Is there oscillated 10.0MHz at pins (31) and (32) of IC801?
NO
Check peripheral circuit of IC801.
YES
Does the capstan FG signal appear at pin (44) of IC801?
NO
Check capstan FG signal line between the AC-MC harness.
YES
Is there capstan AFC signal at pin (25) of IC801?
NO
Replace IC801.
YES
Is there capstan APC signal at pin (24) of IC801?
NO
Does PB signal appear at pins (52), (53) of IC801?
YES
Replace IC801.
NO
Check line between pins (52), (53) and pin (62) of IC801.
YES
Does pin (39) of IC801 operate normally?
NO
Replace IC801.
YES
Check "①"
Check "②"
Only REC mode inoperative.
②
Does V-SYNC signal appear at pin (64) of IC801?
NO
Check composite-SYNC. signal line and filter. (R714~715, C718~721)
YES
Is there REC CTL signal output at pin (56) of IC801?
YES
NO
Only PB inoperative.
①
Does PB CTL signal appear at pins (52), (53) of IC801?
YES
Is there capstan APC signal at pin (24) of IC801?
NO
Replace IC801.
YES
Check capstan motor unit and/or replace.
NO
Does CTL amplifier circuit of IC801 pins (56) to (58) and (59), (62) operate normally?
YES
Check line between pins (52), (53) and pin (62) of IC801.
NO
Does the circuit around pins (56) to (58) and (59), (62) of IC801 operate normally?
NO
Replace defective parts.
YES
Is AA-MH harness good?
NO
Replace AA-MH harness.
YES
Does A/C head operate normally?
NO
Replace A/C head.
YES
Adjust the height of the A/C head.
YES

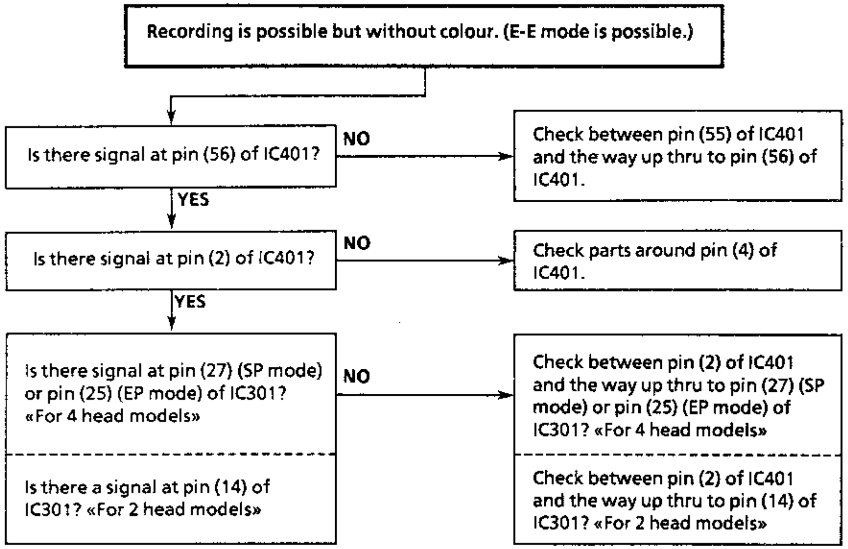
FLOW CHART NO.18 E-E MODE TROUBLESHOOTING


No E-E signal.
(Tuner input mode.)
(Ext. input mode.)
Is there a signal at pin (29) of IC401?
YES
NO
Is there a signal at pin (2) of the IF pack (UNT 1551) ?
NO
YES
Check between pin (2) of the IF pack (UNT1551) and the way up thru to pin (29) of IC401.
Check IF pack (UNT1551) and parts around it.
Is there a signal at pin (31) of IC401?
YES
NO
Is there a signal at Ext. input terminal?
NO
YES
Check between Ext. input terminal and the way up thru to pin (31) of IC401.
Check Ext. input terminal and parts around it.
Is there a signal at pin (27) of IC401?
YES
NO
Check between pin (27) of IC401 and all the way up thru to video output terminal.
Is the supply voltage of 5V fed to pins (26) and (54) of IC401?
NO
Check PC5V lines.
YES
Are there the serial data and clock at pins (14) and (15) of IC401?
NO
Check between pins (14) and (15) of IC401 and the way up thru to pins (2) and (3) of IC801.
YES
Is there signal at pins (39) and (38) of IC401?
NO
Replace IC401.

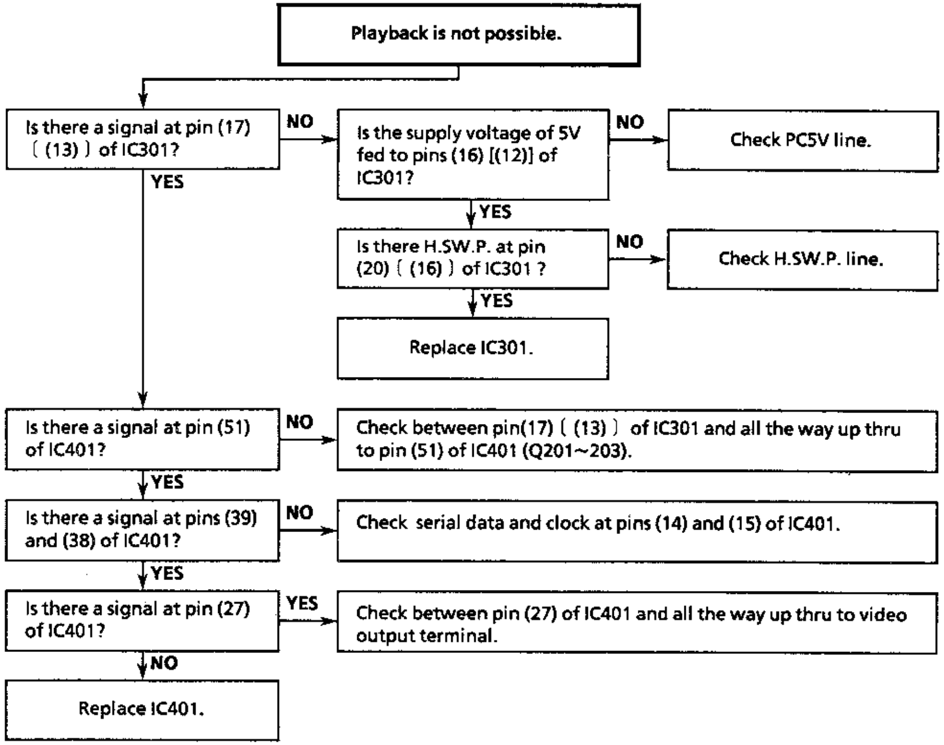
FLOW CHART NO.19 RECORDING MODE (LUMINANCE) TROUBLESHOOTING


Recording is not possible. (E-E mode is possible.)
Is there a signal at pin (47) of IC401?
NO
Check parts around pins (47) and (48) of IC401.
YES
Is there a signal at pins (27) and (25) of IC301? «For 4 head models»
Is there a signal at pin (14) of IC301? «For 2 head models»
NO
Check between pin (52) of IC401 and all the way up thru to pins (27) and (25) of IC301. «For 4 head models»
Check between pin (52) of IC401 and all the way up thru to pin (14) of IC301. «For 2 head models»
YES
Are pins (16) and (28) of IC301 at 5V and 9V respectively? «For 4 head models»
Are pins (12) and (2) of IC301 at 5V and 9V respectively? «For 2 head models»
NO
Check PC5V and bias CTL9V lines.
YES
Is there a signal at pin (7) (SP model) or pin (8) (EP mode) of IC301? «For 4 head models»
Is there a signal at pin (4) of IC301? «For 2 head models»
NO
Check diodes. D301~D302, D330~D331 «For 4 head models» D301~D302«For 2 head models»
YES
Check upper and lower drum.

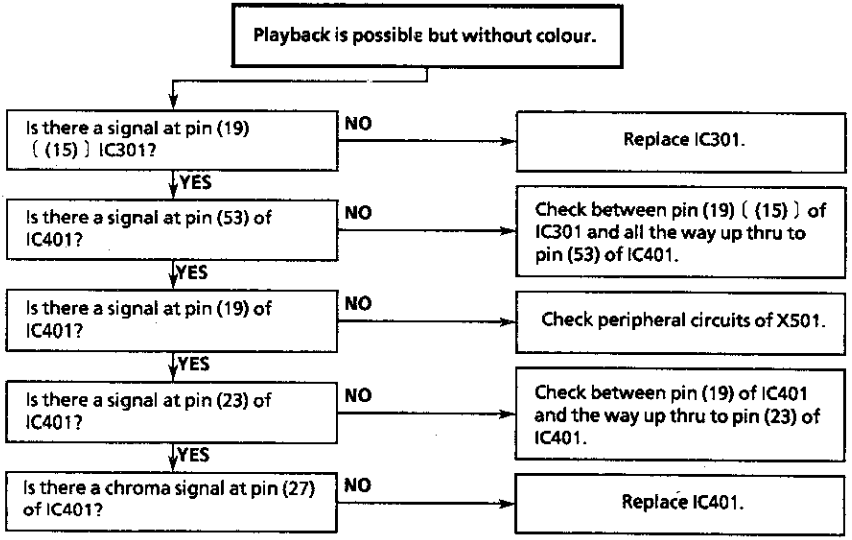
FLOW CHART NO.20 RECORDING MODE (CHROMA) TROUBLESHOOTING


Recording is possible but without colour. (E-E mode is possible.)
Is there signal at pin (56) of IC401?
NO
Check between pin (55) of IC401 and the way up thru to pin (56) of IC401.
YES
Is there signal at pin (2) of IC401?
NO
Check parts around pin (4) of IC401.
YES
Is there signal at pin (27) (SP mode) or pin (25) (EP mode) of IC301? «For 4 head models»
Is there a signal at pin (14) of IC301? «For 2 head models»
NO
Check between pin (2) of IC401 and the way up thru to pin (27) (SP mode) or pin (25) (EP mode) of IC301? «For 4 head models»
Check between pin (2) of IC401 and the way up thru to pin (14) of IC301? «For 2 head models»

FLOW CHART NO.21 PLAYBACK MODE (LUMINANCE) TROUBLESHOOTING

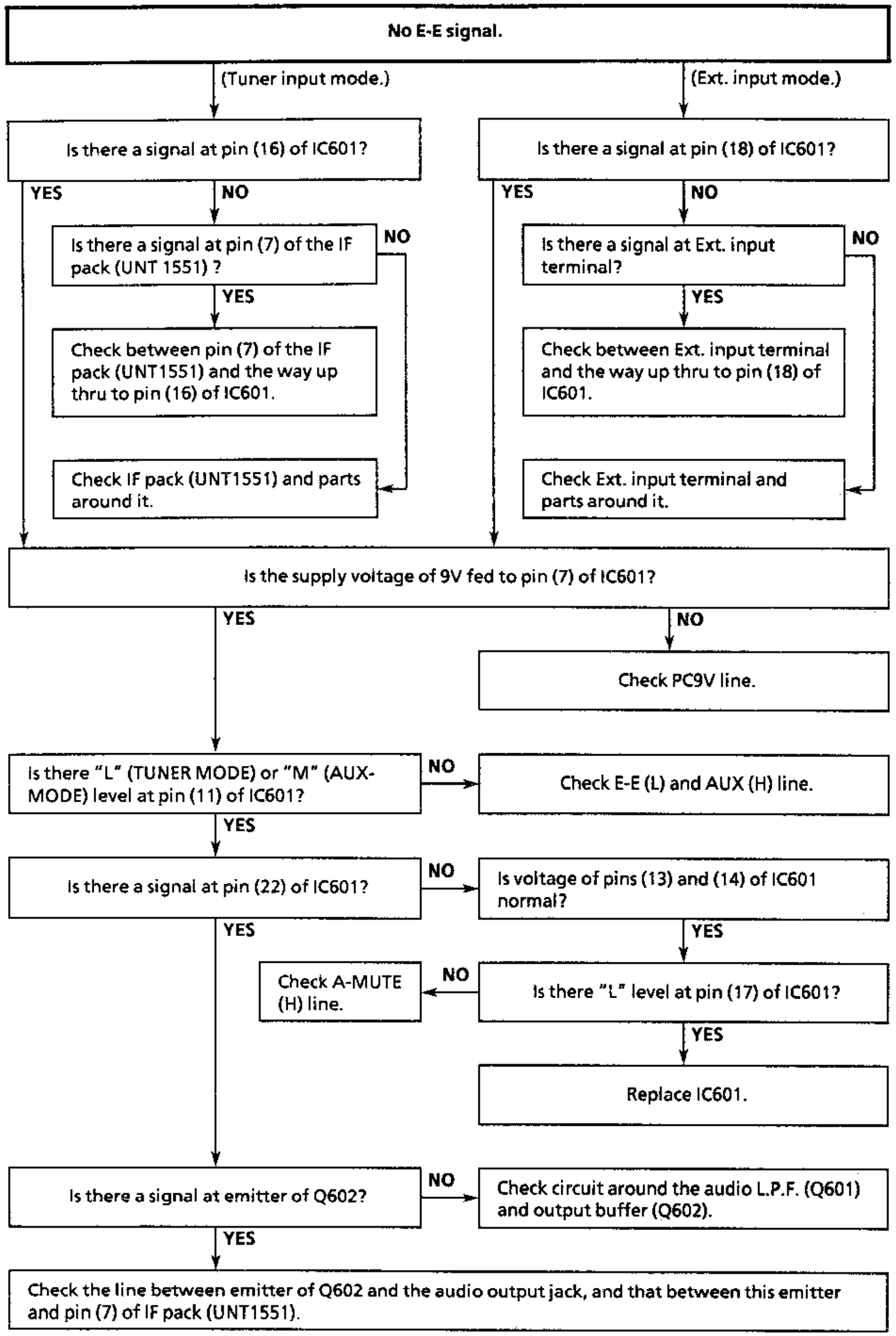

Playback is not possible.
Is there a signal at pin (17) 〔(13)〕 of IC301?
NO
Is the supply voltage of 5V fed to pins (16) [(12)] of IC301?
NO
Check PC5V line.
YES
Is there H.SW.P. at pin (20) 〔(16)〕 of IC301 ?
NO
Check H.SW.P. line.
YES
Replace IC301.
YES
Is there a signal at pin (51) of IC401?
NO
Check between pin(17) 〔(13)〕 of IC301 and all the way up thru to pin (51) of IC401 (Q201~203).
YES
Is there a signal at pins (39) and (38) of IC401?
NO
Check serial data and clock at pins (14) and (15) of IC401.
YES
Is there a signal at pin (27) of IC401?
YES
Check between pin (27) of IC401 and all the way up thru to video output terminal.
NO
Replace IC401.

FLOW CHART NO.22 PLAYBACK MODE (CHROMA) TROUBLESHOOTING

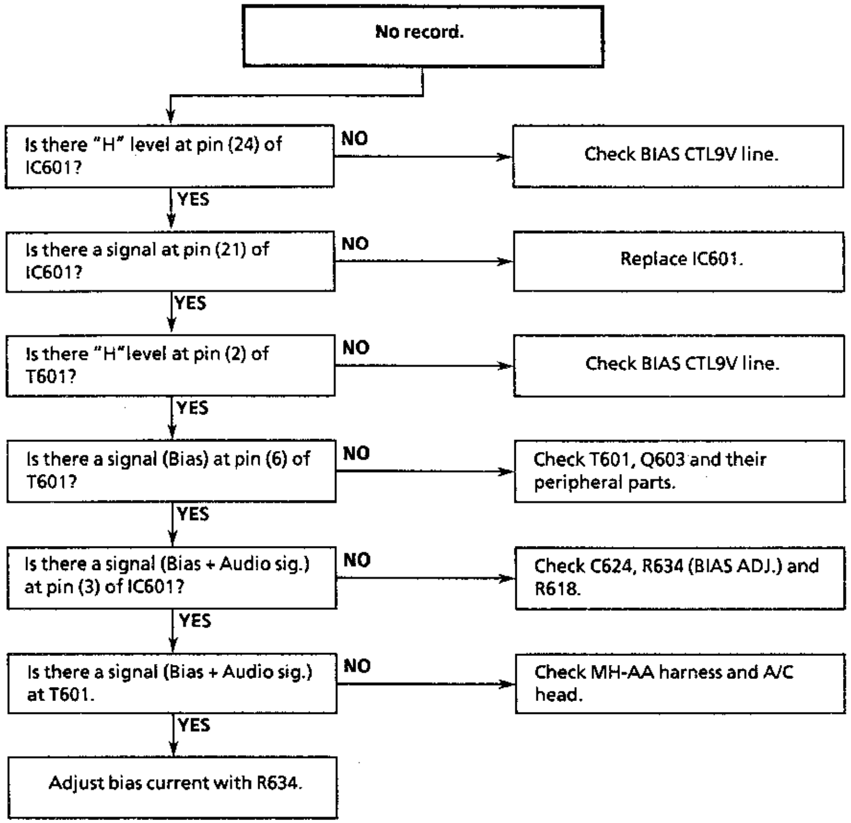

Playback is possible but without colour.
Is there a signal at pin (19) 〔(15)〕 IC301?
NO
Replace IC301.
YES
Is there a signal at pin (53) of IC401?
NO
Check between pin (19) 〔(15)〕 of IC301 and all the way up thru to pin (53) of IC401.
YES
Is there a signal at pin (19) of IC401?
NO
Check peripheral circuits of X501.
YES
Is there a signal at pin (23) of IC401?
NO
Check between pin (19) of IC401 and the way up thru to pin (23) of IC401.
YES
Is there a chroma signal at pin (27) of IC401?
NO
Replace IC401.

Note: Words shown in the bracket " 〔 〕 " are for the 2 head models only.

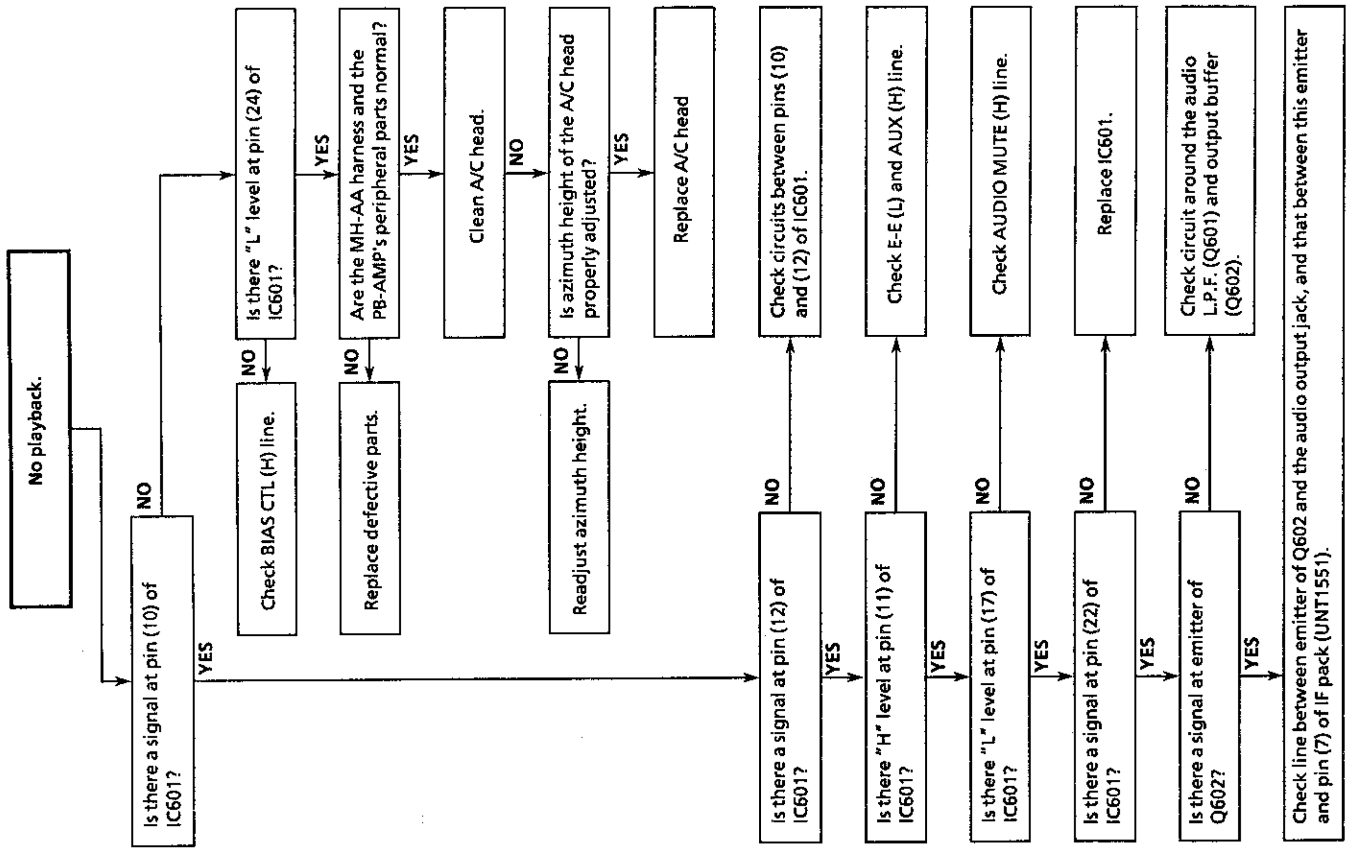
FLOW CHART NO.23 LINEAR SOUND E-E MODE TROUBLESHOOTING


No E-E signal.
(Tuner input mode.)
(Ext. input mode.)
Is there a signal at pin (16) of IC601?
YES
NO
Is there a signal at pin (7) of the IF pack (UNT 1551) ?
NO
YES
Check between pin (7) of the IF pack (UNT1551) and the way up thru to pin (16) of IC601.
Check IF pack (UNT1551) and parts around it.
Is there a signal at pin (18) of IC601?
YES
NO
Is there a signal at Ext. input terminal?
NO
YES
Check between Ext. input terminal and the way up thru to pin (18) of IC601.
Check Ext. input terminal and parts around it.
Is the supply voltage of 9V fed to pin (7) of IC601?
YES
NO
Check PC9V line.
Is there "L" (TUNER MODE) or "M" (AUX-MODE) level at pin (11) of IC601?
NO
Check E-E (L) and AUX (H) line.
YES
Is there a signal at pin (22) of IC601?
NO
Is voltage of pins (13) and (14) of IC601 normal?
YES
Is there "L" level at pin (17) of IC601?
NO
Check A-MUTE (H) line.
YES
Replace IC601.
YES
Is there a signal at emitter of Q602?
NO
Check circuit around the audio L.P.F. (Q601) and output buffer (Q602).
YES
Check the line between emitter of Q602 and the audio output jack, and that between this emitter and pin (7) of IF pack (UNT1551).

FLOW CHART NO.24 LINEAR SOUND RECORDING MODE TROUBLESHOOTING


No record.
Is there "H" level at pin (24) of IC601?
NO
Check BIAS CTL9V line.
YES
Is there a signal at pin (21) of IC601?
NO
Replace IC601.
YES
Is there "H" level at pin (2) of T601?
NO
Check BIAS CTL9V line.
YES
Is there a signal (Bias) at pin (6) of T601?
NO
Check T601, Q603 and their peripheral parts.
YES
Is there a signal (Bias + Audio sig.) at pin (3) of IC601?
NO
Check C624, R634 (BIAS ADJ.) and R618.
YES
Is there a signal (Bias + Audio sig.) at T601.
NO
Check MH-AA harness and A/C head.
YES
Adjust bias current with R634.

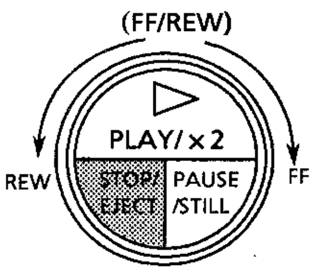
FLOW CHART NO.25 LINEAR SOUND PLAYBACK MODE TROUBLESHOOTING

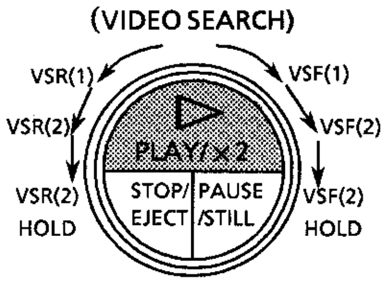

No playback.
Is there a signal at pin (10) of IC601?
NO
YES
Is there "L" level at pin (24) of IC601?
NO
Check BIAS CTL (H) line.
YES
Are the MH-AA harness and the PB-AMP's peripheral parts normal?
NO
Replace defective parts.
YES
Clean A/C head.
NO
Is azimuth height of the A/C head properly adjusted?
NO
Readjust azimuth height.
YES
Replace A/C head
Is there a signal at pin (12) of IC601?
NO
Check circuits between pins (10) and (12) of IC601.
YES
Is there "H" level at pin (11) of IC601?
NO
Check E-E (L) and AUX (H) line.
YES
Is there "L" level at pin (17) of IC601?
NO
Check AUDIO MUTE (H) line.
YES
Is there a signal at pin (22) of IC601?
NO
Replace IC601.
YES
Is there a signal at emitter of Q602?
NO
Check circuit around the audio L.P.F. (Q601) and output buffer (Q602).
YES
Check line between emitter of Q602 and the audio output jack, and that between this emitter and pin (7) of IF pack (UNT1551).

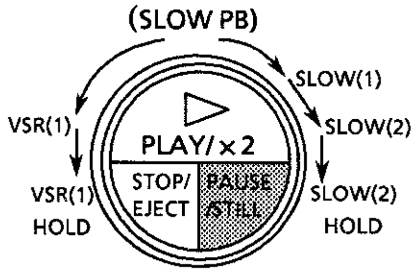
DESCRIPTION OF SHUTTLE FUNCTION

1. Description of operation.

The shuttle system is designed to control the basic modes of the VCR with the use of shuttle ring.







Fast Forward and Rewind

(Unit)
Stop the PB mode. Turn the ring clockwise or counterclockwise and release it (the shuttle ring returns to the center point), and the unit will be in the FF or REW mode.
(Remote controller)
Stop the PB mode and press the FF or REW button.

Video Search

(Unit)
During playback, turn the ring clockwise or counterclockwise and hold it, and the unit will be in the VSF or VSR mode. The search speed is variable in two steps depending on the turning angle. Release the ring (the shuttle ring returns to the center point) and the unit will be back in the PB mode.
(Remote controller)
During playback, press the FF or REW button, and the unit will be in the VSF orVSR mode. Each time the button is pressed, the search speed changes in the order of (2) → (1) → (2).

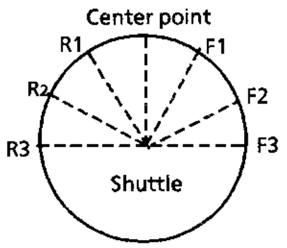
Tape Speed

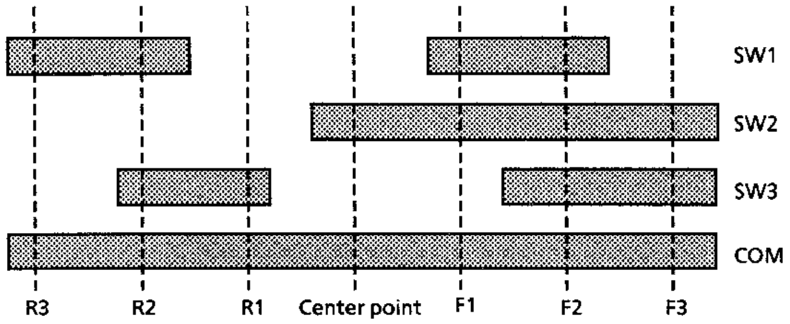
	VSF/VSR (1)	VSF/VSR (2)	SLOW (1)	SLOW (2)
SP/LP	×3	×7	1/30	1/10

Variable Slow Motion

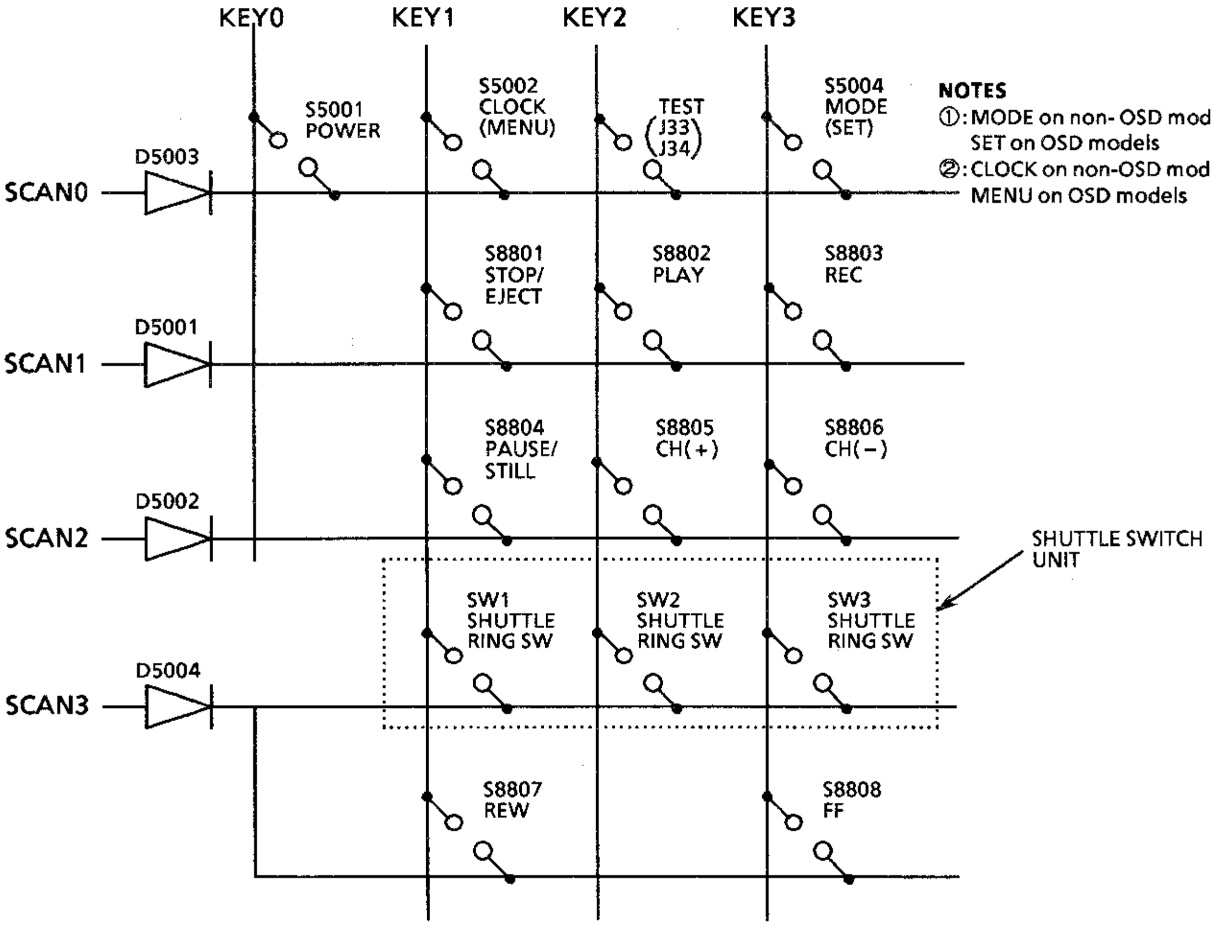
(Unit)
During pause, turn the ring clockwise and hold it to go to the SLOW PB mode. The slow play speed is variable in two steps depending on the turning angle. Release the ring (the shuttle ring returns to the center point), and the unit will be back in the PAUSE mode. When the ring is turned all the way clockwise, the SLOW PB mode is held.
For returning to the usual play or pause, press the PB button or the PAUSE button.
During pause, turn the ring counterclockwise and hold it to go to the VSR mode. Release the ring, and the unit will be back in the PAUSE mode. When the ring is turned all the way counterclockwise, the VSR mode is held.
(Remote controller)
During play, pause, fast play or video search, press the SLOW button and the unit will in the SLOW PB mode. The slow play speed can be changed between 1/30 and 1/10 using the SLOW buttons (+) and (−). If noises appear on the TV screen, make adjustment using the TRACK buttons (+) and (−). Press the PLAY/×2 button to resume the usual play.

2. Shuttle ring key matrix outline


Center point
R1
F1
R2
F2
R3
F3
Shuttle


SW1
SW2
SW3
COM
R3
R2
R1
Center point
F1
F2
F3

	R3	R2	R1	Center point	F1	F2	F3
SW1	1	1	0	0	1	1	0
SW2	0	0	0	1	1	1	1
SW3	0	1	0	0	0	1	1


KEY0
KEY1
KEY2
KEY3
S5001
POWER
S5002
CLOCK
(MENU)
TEST
(J33
J34)
S5004
MODE
(SET)
D5003
SCAN0
S8801
STOP/
EJECT
S8802
PLAY
S8803
REC
D5001
SCAN1
S8804
PAUSE/
STILL
S8805
CH(+)
S8806
CH(−)
D5002
SCAN2
SHUTTLE SWITCH
UNIT
SW1
SHUTTLE
RING SW
SW2
SHUTTLE
RING SW
SW3
SHUTTLE
RING SW
D5004
SCAN3
S8807
REW
S8808
FF

NOTES
①: MODE on non- OSD models
SET on OSD models
②: CLOCK on non-OSD models
MENU on OSD models

3. Shuttle control specifications

1) The FF and REW modes are continued with the ring at the center position.
2) The search and slow play speeds are as follows.

	VSF (1)/VSR (1)	VSF (2)/VSR (2)	SLOW (1)	SLOW (2)
SP/LP	×3	×7	1/30	1/10

※ The shuttle ring dose not click at the clockwise and counterclockwise ends. Being released at any point it returns to the center point.

3) Stop mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (FF)	REW	REW	REW	FF Continued	FF	FF	——
F2 (FF)	REW	REW	REW	FF Continued	FF	——	FF
F1 (FF)	REW	REW	REW	FF Continued	——	FF	FF
Center point (STOP)	REW	REW	REW	——	FF	FF	FF
R1 (REW)	REW	REW	——	REW Continued	FF	FF	FF
R2 (REW)	REW	——	REW	REW Continued	FF	FF	FF
R3 (REW)	——	REW	REW	REW Continued	FF	FF	FF

4) Play Mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (VSF2)	VSR2	VSR2	VSR1	VSF2 Continued	VSF2 Continued	VSF2 Continued	——
F2 (VSF2)	VSR2	VSR2	VSR1	PLAY Continued	VSF1	——	VSF2
F1 (VSF1)	VSR2	VSR2	VSR1	PLAY Continued	——	VSF2	VSF2
Center point (PLAY)	VSR2	VSR2	VSR1	——	VSF1	VSF2	VSF2
R1 (VSR1)	VSR2	VSR2	——	PLAY Continued	VSF1	VSF2	VSF2
R2 (VSR2)	VSR2	——	VSR1	PLAY Continued	VSF1	VSF2	VSF2
R3 (VSR2)	——	VSR2 Continued	VSR2 Continued	VSR2 Continued	VSF1	VSF2	VSF2

5) Still mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (SLOW2)	VSR1	VSR1	VSR1	SLOW2 Continued	SLOW2 Continued	SLOW2 Continued	——
F2 (SLOW2)	VSR1	VSR1	VSR1	STILL Continued	SLOW1	——	SLOW2
F1 (SLOW1)	VSR1	VSR1	VSR1	STILL Continued	——	SLOW2	SLOW2
Center point (STILL)	VSR1	VSR1	VSR1	——	SLOW1	SLOW2	SLOW2
R1 (VSR1)	VSR1	VSR1	——	STILL Continued	SLOW1	SLOW2	SLOW2
R2 (VSR2)	VSR1	——	VSR1	STILL Continued	SLOW1	SLOW2	SLOW2
R3 (VSR2)	——	VSR1 Continued	VSR1 Continued	VSR1 Continued	SLOW1	SLOW2	SLOW2

※ When the ring is released from the F1 or F2 point, the unit back in the initial mode (PLAY or STILL) mode. When it is turned up to the F3 point and then released back to the center point, the unit continues the previous mode (F3 mode).
The FF and REW modes are continued when the ring has come from the F1, F2 or F3 point to the center point.

REPLACEMENT OF IC804 (E^{2}PROM)

≪Servicing precautions≫

When the IC804 (E^{2}PROM) has been replaced, make the following reprogramming.
Depending on models, the IC804 (E^{2}PROM) has been factory adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the slow and still modes.

(1) Memory function reprogramming.

1. Check the power off. (Power is standby mode)
2. Make for a moment short circuit between jumper pins 33 and 34, both located at the left on your side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
3. Using the CHANNEL (+) and (−) buttons, select the right function numbers from among JP0-JP31, which appear in the fluorescent display tube, referring to the E^{2}PROM map.
   Press the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).

* When the DISPLAY button has been pressed (ON), the memory function No. starts flashing.
* When the CLEAR button has been pressed (OFF), the memory function No. lights up.

4. Make the short circuit between cathode of D5001 and jumper pin 391, both located at the front on your side on the main PWB, and the settings will be displayed in hexadecimal notation.
   Now you can see if the settings are correct.

Example: "ON" and "OFF" are taken as "1" and "0" respectively. The numbers JP0 to JP31 are divided into eight groups and each group's setting is displayed in hexadecimal notation.

J31	J30	J29	J28	J27	J26	J25	J24	J23	J22	J21	J20	J19	J18	J17	J16
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
⇩ SPACE				⇩ 0				⇩ 0				⇩ 0			

J15	J14	J13	J12	J11	J10	J9	J8	J7	J6	J5	J4	J3	J2	J1	J0
0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1
⇩ 0				⇩ 4				⇩ 0				⇩ D			

"000040D" appears in the fluorescent display tube.

5. Finally make for moment short circuited jumper pins 33 and 34 on the main PWB to clear the TEST mode or press the operate button to turn the power on.

(2) Memory guide channel mapping of VIDEO plus $^+$ reprogramming

1. Press the MENU key to call the MENU on the screen. (Make presetting while watching the TV monitor screen.)
2. Select No.7 and call the GUIDE CH Preset on the screen.
3. Adjust the initial mapping of the GUIDE CH (3 digits) to the PRESET CH. See the accompanying table (A).

Note: The table (A) covers the initial mapping data that have been factory-set. If the data have been modified by the user, it is better to enter the modified data.

REPLACEMENT OF IC804 (E^{2}PROM)

≪Servicing precautions≫

When the IC804 (E^{2}PROM) has been replaced, make the following reprogramming.
Depending on models, the IC804 (E^{2}PROM) has been factory adjusted for it's memory function.
It's therefore necessary to reprogram the memory function for the model in question.
Note that the servo circuit requires readjustments for the slow and still modes.

(1) Memory function reprogramming.

1. Check the power off. (Power is standby mode)
2. Make for a moment short circuit between jumper pins 33 and 34, both located at the left on your side on the main PWB.
   Be sure that all the fluorescent display tubes light up into the TEST mode.
3. Using the CHANNEL (+) and (−) buttons, select the right function numbers from among JP0-JP31, which appear in the fluorescent display tube, referring to the E^{2}PROM map.
   Press the DISPLAY button to pick up the functions (ON) and the CLEAR button to discard the functions (OFF).

* When the DISPLAY button has been pressed (ON), the memory function No. starts flashing.
* When the CLEAR button has been pressed (OFF), the memory function No. lights up.

4. Make the short circuit between cathode of D5001 and jumper pin 391, both located at the front on your side on the main PWB, and the settings will be displayed in hexadecimal notation.
   Now you can see if the settings are correct.

Example: "ON" and "OFF" are taken as "1" and "0" respectively. The numbers JP0 to JP31 are divided into eight groups and each group's setting is displayed in hexadecimal notation.

J31	J30	J29	J28	J27	J26	J25	J24	J23	J22	J21	J20	J19	J18	J17	J16
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
⇩ SPACE				⇩ 0				⇩ 0				⇩ 0			

J15	J14	J13	J12	J11	J10	J9	J8	J7	J6	J5	J4	J3	J2	J1	J0
0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	1
⇩ 0				⇩ 4				⇩ 0				⇩ D			

"000040D" appears in the fluorescent display tube.

5. Finally make for moment short circuited jumper pins 33 and 34 on the main PWB to clear the TEST mode or press the operate button to turn the power on.

(2) Memory guide channel mapping of VIDEO plus $^+$ reprogramming

1. Press the MENU key to call the MENU on the screen. (Make presetting while watching the TV monitor screen.)
2. Select No.7 and call the GUIDE CH Preset on the screen.
3. Adjust the initial mapping of the GUIDE CH (3 digits) to the PRESET CH. See the accompanying table (A).

Note: The table (A) covers the initial mapping data that have been factory-set. If the data have been modified by the user, it is better to enter the modified data.

3) Stop mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (FF)	REW	REW	REW	FF Continued	FF	FF	——
F2 (FF)	REW	REW	REW	FF Continued	FF	——	FF
F1 (FF)	REW	REW	REW	FF Continued	——	FF	FF
Center point (STOP)	REW	REW	REW	——	FF	FF	FF
R1 (REW)	REW	REW	——	REW Continued	FF	FF	FF
R2 (REW)	REW	——	REW	REW Continued	FF	FF	FF
R3 (REW)	——	REW	REW	REW Continued	FF	FF	FF

4) Play Mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (VSF2)	VSR2	VSR2	VSR1	VSF2 Continued	VSF2 Continued	VSF2 Continued	——
F2 (VSF2)	VSR2	VSR2	VSR1	PLAY Continued	VSF1	——	VSF2
F1 (VSF1)	VSR2	VSR2	VSR1	PLAY Continued	——	VSF2	VSF2
Center point (PLAY)	VSR2	VSR2	VSR1	——	VSF1	VSF2	VSF2
R1 (VSR1)	VSR2	VSR2	——	PLAY Continued	VSF1	VSF2	VSF2
R2 (VSR2)	VSR2	——	VSR1	PLAY Continued	VSF1	VSF2	VSF2
R3 (VSR2)	——	VSR2 Continued	VSR2 Continued	VSR2 Continued	VSF1	VSF2	VSF2

5) Still mode

Initial position	Set position						
	R3	R2	R1	Center point	F1	F2	F3
F3 (SLOW2)	VSR1	VSR1	VSR1	SLOW2 Continued	SLOW2 Continued	SLOW2 Continued	——
F2 (SLOW2)	VSR1	VSR1	VSR1	STILL Continued	SLOW1	——	SLOW2
F1 (SLOW1)	VSR1	VSR1	VSR1	STILL Continued	——	SLOW2	SLOW2
Center point (STILL)	VSR1	VSR1	VSR1	——	SLOW1	SLOW2	SLOW2
R1 (VSR1)	VSR1	VSR1	——	STILL Continued	SLOW1	SLOW2	SLOW2
R2 (VSR2)	VSR1	——	VSR1	STILL Continued	SLOW1	SLOW2	SLOW2
R3 (VSR2)	——	VSR1 Continued	VSR1 Continued	VSR1 Continued	SLOW1	SLOW2	SLOW2

※ When the ring is released from the F1 or F2 point, the unit back in the initial mode (PLAY or STILL) mode. When it is turned up to the F3 point and then released back to the center point, the unit continues the previous mode (F3 mode).
The FF and REW modes are continued when the ring has come from the F1, F2 or F3 point to the center point.

		A39GM	A39SM A239SM	A239GM	A39HM	A39LM	A50HM	A50LM	A49GM	A62GM	A62SM	A462GM	A462SM	A72GM	A72HM	A72LM
JP31	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	NT-PB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	HEAD1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
24	HEAD0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0
23	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Hi-Fi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	NICAM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	G-CODE1	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1
16	G-CODE0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
15	OEM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	LP	0	0	0	1	1	1	1	0	1	1	1	1	1	1	1
13	---	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	SHUTTLE	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1
11	LINE2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
10	CATV	1	0	0	0	0	0	1	1	1	0	0	0	1	0	1
9	TUNER1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
8	TUNER0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0
7	DECODER	0	0	0	0	0	1	1	1	0	0	0	0	1	1	1
6	SYSTEM-I	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	VCR1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0
4	VCR0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	PDC	1	0	1	0	0	0	0	1	1	0	1	0	1	1	1
2	VPS	1	0	1	0	0	0	0	1	1	0	1	0	1	1	1
1	COLOUR1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	COLOUR0	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0
	DISPLAY	000040D	0000001	000000D	1004120	1004000	10343A0	1034680	002048D	200540D	2005001	200400D	2004001	2025C8D	2035BAC	2035E8C

(Note: "1" : flashing "0" : lights up)

<PRESET CH. for following MODELS>

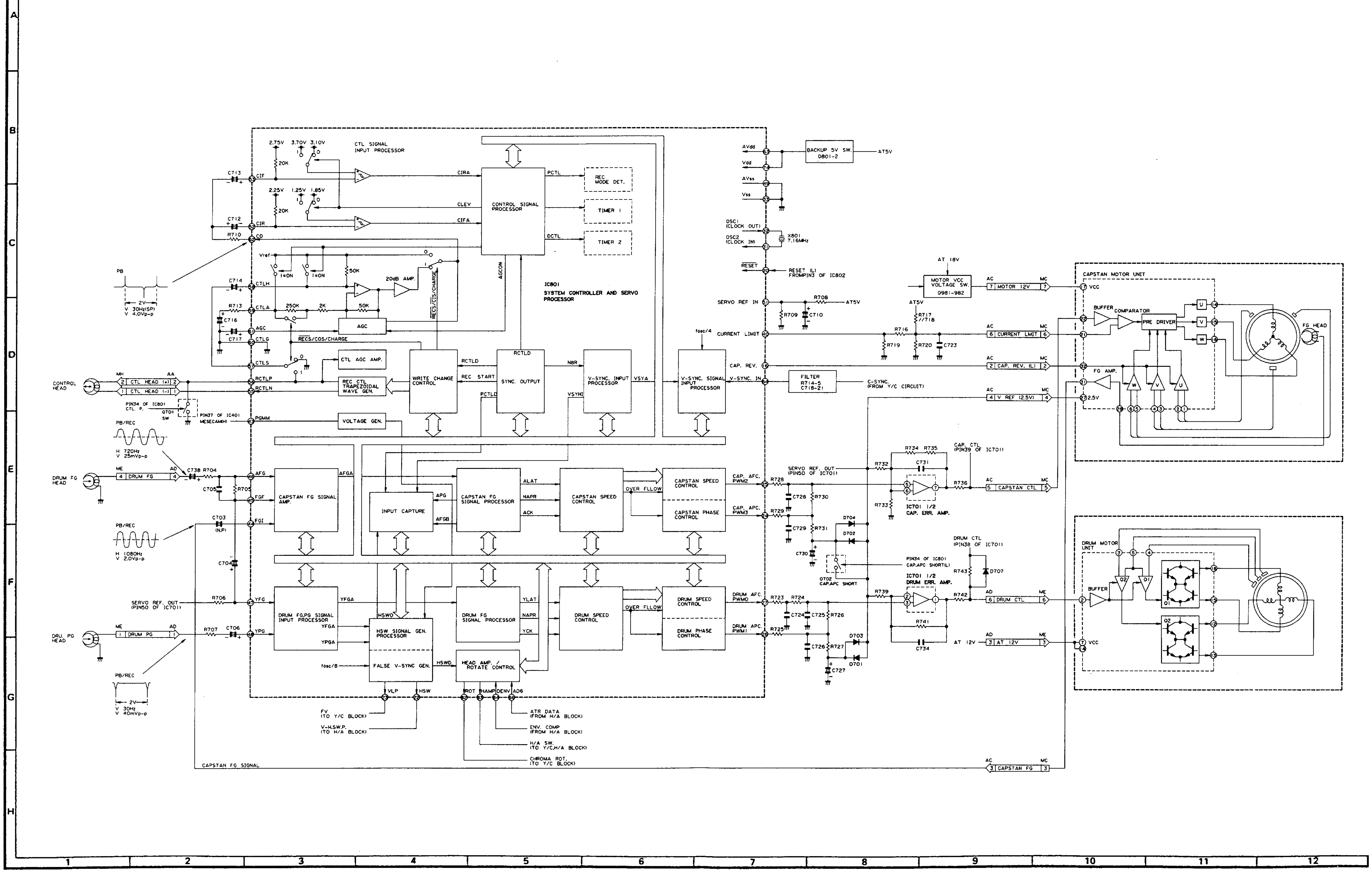
MODEL / GUIDE CH No.	VIDEO PLUS +		G-CODE		SHOW VIEW	
	VC-A50HM/LM	VC-A72HM/LM	VC-A42NZ	VC-A72NZ	VC-A49G	VC-A72GM
001	Pr 01	Pr 01	Pr 01	Pr 01	Pr — —	Pr — —
002	↑ 02	↑ 02	↑ 02	↑ 02		
003	03	03	03	03		
004	04	04	04	04		
005	05	05	04	04		
006	06	06	04	04		
007	Pr — —	Pr — —	07	07		
008			08	08		
009			Pr — —	Pr — —		
010						
011						
012						
013						
~						
016						
017 ~ 099	▧	▧				
101 ~ 149	AV	L1				
150 ~ 199	▧	▧				
201 ~ 249	Pr 07	Pr 07				
250 ~ 255	▧	▧				

NOTES: 1. Pr — — means that no mapping is needed.
2. ▧ means that there is no GUIDE CH to be mapped.

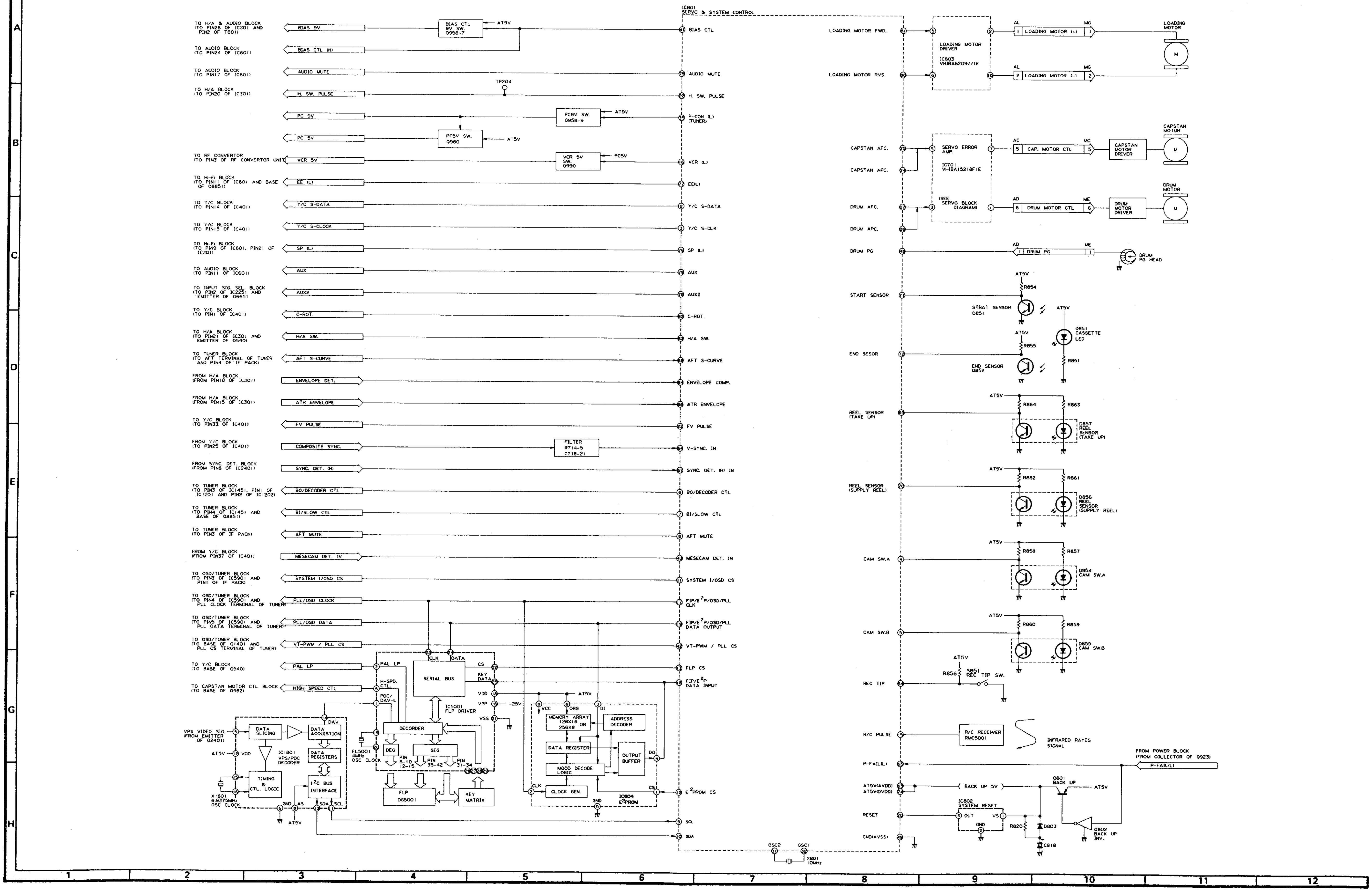
Table A.

8. BLOCK DIAGRAM

SERVO PROCESS BLOCK DIAGRAM

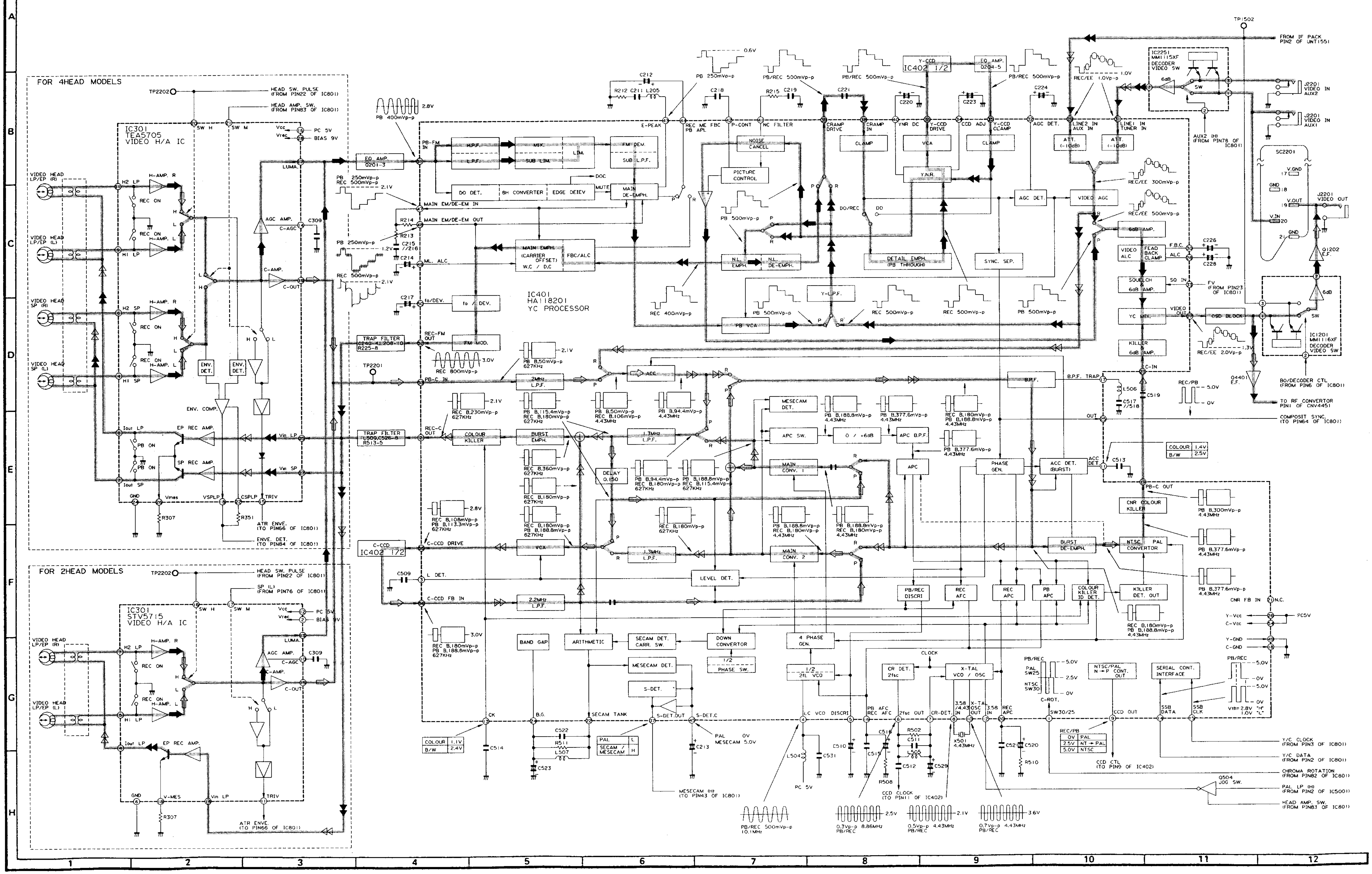

A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12
2.75V 3.70V 3.10V
20K
2.25V 1.25V 1.85V
CTL SIGNAL INPUT PROCESSOR
C713
CIF
C712
CIR
R710
CO
CIRA
CLEV
CIFA
CONTROL SIGNAL PROCESSOR
PCTL
DCTL
REC MODE DET.
TIMER 1
TIMER 2
AGCON
Vref
1=ON
50K
20dB AMP.
RECS/CIS/CHARGE
PB
2V
V 30Hz(SP)
V 4.0Vp-p
C714
CTLH
R713
CTLA
C716
AGC
C717
CTLG
250K
2K
RECS/COS/CHARGE
CTLS
CTL AGC AMP.
IC801
SYSTEM CONTROLLER AND SERVO PROCESSOR
CONTROL HEAD
MH
AA
CTL HEAD (+)
CTL HEAD (-)
RCTLP
RCTLN
REC CTL TRAPEZOIDAL WAVE GEN.
WRITE CHANGE CONTROL
RCTLD
REC START
PCTLD
SYNC. OUTPUT
N8R
VSYNI
V-SYNC. INPUT PROCESSOR
VSYA
fosc/4
V-SYNC. SIGNAL INPUT PROCESSOR
PIN34 OF IC801 CTL. P.
Q701 SW
PIN37 OF IC401 MESECAM(H)
PGMM
VOLTAGE GEN.
PB/REC
H 720Hz
V 25mVp-p
DRUM FG HEAD
ME
AD
DRUM FG
C738 R704
C705
R705
AFG
FGF
CAPSTAN FG SIGNAL AMP.
AFGA
INPUT CAPTURE
APG
AFGB
CAPSTAN FG SIGNAL PROCESSOR
ALAT
NAPR
ACK
CAPSTAN SPEED CONTROL
OVER FLLOW
CAPSTAN SPEED CONTROL
CAPSTAN PHASE CONTROL
C703 (N.P)
FGI
H 1080Hz
V 2.0Vp-p
C704
SERVO REF. OUT (PIN50 OF IC701)
R706
YFG
DRUM FG,PG SIGNAL INPUT PROCESSOR
YFGA
YPGA
HSWO
HSW SIGNAL GEN. PROCESSOR
FALSE V-SYNC GEN.
fosc/8
HSWD
HEAD AMP. / ROTATE CONTROL
DRUM FG SIGNAL PROCESSOR
YLAT
YCK
DRUM SPEED CONTROL
DRUM SPEED CONTROL
DRUM PHASE CONTROL
DRU. PG HEAD
DRUM PG
R707 C706
YPG
V 30Hz
V 40mVp-p
VLP
HSW
ROT
HAMP
DENV
AD6
FV (TO Y/C BLOCK)
V-H.SW.P. (TO H/A BLOCK)
ATR DATA (FROM H/A BLOCK)
ENV. COMP (FROM H/A BLOCK)
H/A SW. (TO Y/C,H/A BLOCK)
CHROMA ROT. (TO Y/C BLOCK)
CAPSTAN FG SIGNAL
AVdd
Vdd
AVss
Vss
BACKUP 5V SW. Q801-2
AT5V
OSC1 (CLOCK OUT)
OSC2 (CLOCK IN)
X801 7.16MHz
RESET
RESET (L) FROMPIN3 OF IC802
SERVO REF IN
R708
R709
C710
CURRENT LIMIT
CAP. REV.
V-SYNC. IN
FILTER R714-5 C718-21
C-SYNC. (FROM Y/C CIRCUIT)
AT 18V
MOTOR VCC VOLTAGE SW. Q981-982
AC
MC
MOTOR 12V
R717 //718
R716
R719
R720
C723
CURRENT LMIT
CAP. REV. (L)
V REF (2.5V)
CAPSTAN MOTOR UNIT
VCC
BUFFER
COMPARATOR
PRE DRIVER
U
V
W
FG HEAD
FG AMP.
2.5V
CAP. AFC. PWM2
CAP. APC. PWM3
R728
C728
R730
R729
C729
R731
C730
D704
D702
R732
R733
R734 R735
C731
IC701 1/2 CAP. ERR. AMP.
CAP. CTL (PIN39 OF IC701)
R736
CAPSTAN CTL
PIN34 OF IC801 CAP.APC SHORT(L)
Q702 CAP.APC SHORT
DRUM CTL (PIN38 OF IC701)
R743
D707
IC701 1/2 DRUM ERR. AMP.
DRUM AFC. PWM0
DRUM APC. PWM1
R723 R724
C724
C725
R726
R725
C726
R727
C727
D703
D701
R739
R741
C734
R742
DRUM CTL
AT 12V
DRUM MOTOR UNIT
Q1
Q2
CAPSTAN FG

SYSTEM CONTROL BLOCK DIAGRAM

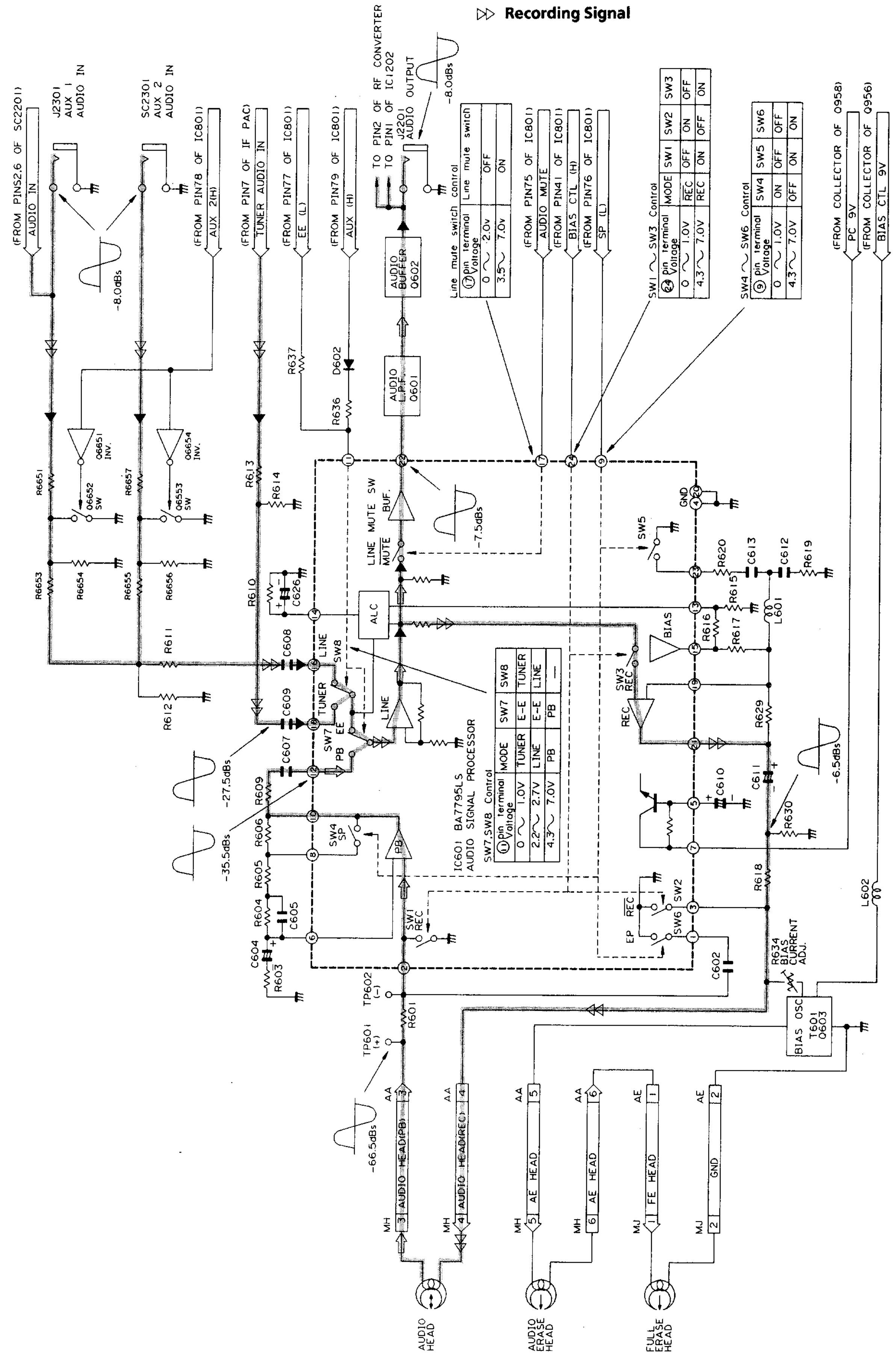

A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12
IC801
SERVO & SYSTEM CONTROL
TO H/A & AUDIO BLOCK (TO PIN28 OF IC301 AND PIN2 OF T601)
BIAS 9V
BIAS CTL 9V SW. Q956-7
AT9V
41 BIAS CTL
TO AUDIO BLOCK (TO PIN24 OF IC601)
BIAS CTL (H)
TO AUDIO BLOCK (TO PIN17 OF IC601)
AUDIO MUTE
75 AUDIO MUTE
TO H/A BLOCK (TO PIN20 OF IC301)
H. SW. PULSE
TP204
22 H. SW. PULSE
PC 9V
PC9V SW. Q958-9
AT9V
35 P-CON (L) (TUNER)
PC 5V
PC5V SW. Q960
AT5V
TO RF CONVERTOR (TO PIN3 OF RF CONVERTOR UNIT)
VCR 5V
VCR 5V SW. Q990
PC5V
16 VCR (L)
TO Hi-Fi BLOCK (TO PIN11 OF IC601 AND BASE OF Q8851)
EE (L)
77 EE(L)
TO Y/C BLOCK (TO PIN14 OF IC401)
Y/C S-DATA
2 Y/C S-DATA
TO Y/C BLOCK (TO PIN15 OF IC401)
Y/C S-CLOCK
3 Y/C S-CLK
TO Hi-Fi BLOCK (TO PIN9 OF IC601, PIN21 OF IC301)
SP (L)
76 SP (L)
TO AUDIO BLOCK (TO PIN11 OF IC601)
AUX
79 AUX
TO INPUT SIG. SEL. BLOCK (TO PIN2 OF IC2251 AND EMITTER OF Q6651
AUX2
78 AUX2
TO Y/C BLOCK (TO PIN1 OF IC401)
C-ROT.
82 C-ROT.
TO H/A BLOCK (TO PIN21 OF IC301 AND EMITTER OF Q540)
H/A SW.
83 H/A SW.
TO TUNER BLOCK (TO AFT TERMINAL OF TUNER AND PIN4 OF IF PACK)
AFT S-CURVE
68 AFT S-CURVE
FROM H/A BLOCK (FROM PIN18 OF IC301)
ENVELOPE DET.
84 ENVELOPE COMP.
FROM H/A BLOCK (FROM PIN15 OF IC301)
ATR ENVELOPE
66 ATR ENVELOPE
TO Y/C BLOCK (TO PIN33 OF IC401)
FV PULSE
23 FV PULSE
FROM Y/C BLOCK (TO PIN25 OF IC401)
COMPOSITE SYNC.
FILTER R714-5 C718-21
64 V-SYNC. IN
FROM SYNC. DET. BLOCK (FROM PIN8 OF IC2401)
SYNC. DET. (H)
67 SYNC. DET. (H) IN
TO TUNER BLOCK (TO PIN3 OF IC1451, PIN1 OF IC1201 AND PIN2 OF IC1202)
BO/DECODER CTL
6 BO/DECODER CTL
TO TUNER BLOCK (TO PIN4 OF IC1451 AND BASE OF Q8851)
BI/SLOW CTL
7 BI/SLOW CTL
TO TUNER BLOCK (TO PIN3 OF IF PACK)
AFT MUTE
8 AFT MUTE
FROM Y/C BLOCK (FROM PIN37 OF IC401)
MESECAM DET. IN
43 MESECAM DET. IN
TO OSD/TUNER BLOCK (TO PIN3 OF IC5901 AND PIN1 OF IF PACK)
SYSTEM I/OSD CS
11 SYSTEM I/OSD CS
TO OSD/TUNER BLOCK (TO PIN4 OF IC5901 AND PLL CLOCK TERMINAL OF TUNER)
PLL/OSD CLOCK
17 FIP/E²P/OSD/PLL CLK
TO OSD/TUNER BLOCK (TO PIN5 OF IC5901 AND PLL DATA TERMINAL OF TUNER)
PLL/OSD DATA
19 FIP/E²P/OSD/PLL DATA OUTPUT
TO OSD/TUNER BLOCK (TO BASE OF Q1401 AND PLL CS TERMINAL OF TUNER)
VT-PWM / PLL CS
42 VT-PWM / PLL CS
TO Y/C BLOCK (TO BASE OF Q540)
PAL LP
13 FLP CS
TO CAPSTAN MOTOR CTL BLOCK (TO BASE OF Q982)
HIGH SPEED CTL
18 FIP/E²P DATA INPUT
23 CLK
24 DATA
2 PAL LP
5 H-SPD. CTL.
1 PDC/DAV-L
SERIAL BUS
CS 22
KEY DATA 25
VDD 18
VPP 16
-25V
VSS 21
AT5V
IC5001
FLP DRIVER
DECORDER
DEG
SEG
PIN 6-10 12-15
PIN 35-42
PIN 31-34
26 27 28 29
19
20
FL5001 4MHz OSC CLOCK
FLP DG5001
KEY MATRIX
14 DAV
VPS VIDEO SIG. (FROM EMITTER OF Q2401)
5
DATA SLICING
DATA ACQUISTION
DATA REGISTERS
IC1801
VPS/PDC DECODER
AT5V 12 VDD
15
16
TIMING & CTL. LOGIC
I²C BUS INTERFACE
X1801 6.9375MHz OSC CLOCK
6 GND
8 AS
13 SDA
11 SCL
AT5V
8 VCC
6 ORG
3 DI
MEMORY ARRAY 128X16 OR 256X8
ADDRESS DECODER
DATA REGISTER
OUTPUT BUFFER
DO 4
MOOD DECODE LOGIC
2 CLK
CLOCK GEN.
CS 1
GND 5
IC804
E²PROM
12 E²PROM CS
9 SCL
10 SDA
OSC2 31
OSC1 32
X801 10MHz
LOADING MOTOR FWD. 81
LOADING MOTOR RVS. 80
5
6
LOADING MOTOR DRIVER
IC803
VHIBA6209//1E
2
10
AL
MG
1 LOADING MOTOR (+) 1
2 LOADING MOTOR (-) 2
LOADING MOTOR
M
CAPSTAN AFC. 25
CAPSTAN APC. 24
DRUM AFC. 27
DRUM APC. 26
SERVO ERROR AMP.
IC701
VHIBA15218F1E
(SEE SERVO BLOCK DIAGRAM)
7
1
3
AC
MC
5 CAP. MOTOR CTL 5
CAPSTAN MOTOR DRIVER
CAPSTAN MOTOR
AD
ME
6 DRUM MOTOR CTL 6
DRUM MOTOR DRIVER
DRUM MOTOR
DRUM PG 48
1 DRUM PG 1
DRUM PG HEAD
START SENSOR 71
AT5V
R854
STRAT SENSOR Q851
AT5V
D851 CASSETTE LED
R851
END SESOR 72
R855
END SENSOR Q852
REEL SENSOR (TAKE UP) 69
R864
R863
D857 REEL SENSOR (TAKE UP)
REEL SENSOR (SUPPLY REEL) 70
R862
R861
D856 REEL SENSOR (SUPPLY REEL)
CAM SW.A 4
R858
R857
D854 CAM SW.A
CAM SW.B 5
R860
R859
D855 CAM SW.B
REC TIP 54
R856
S851 REC TIP SW.
R/C PULSE 15
R/C RECEIVER RMC5001
INFRARED RAYES SIGNAL
P-FAIL(L) 65
FROM POWER BLOCK (FROM COLLECTOR OF Q923)
P-FAIL(L)
AT5V(AVDD) 63
AT5V(DVDD) 74
(BACK UP 5V)
Q801 BACK UP
RESET 20
IC802 SYSTEM RESET
3 OUT
VS 1
GND 2
R820
D803
C818
Q802 BACK UP INV.
GND(AVSS) 49

SIGNAL FLOW BLOCK DIAGRAM

⇨ Playback Chrominance Signal
➡ Playback Luminance Signal
▷▷ Recording Chrominance Signal
▶▶ Recording Luminance Signal
▶ E-E Signal


A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12
FOR 4HEAD MODELS
TP2202
HEAD SW. PULSE (FROM PIN22 OF IC801)
HEAD AMP. SW. (FROM PIN83 OF IC801)
IC301 TEA5705 VIDEO H/A IC
SW H
SW M
PC 5V
BIAS 9V
VIDEO HEAD LP/EP (R)
VIDEO HEAD LP/EP (L)
VIDEO HEAD SP (R)
VIDEO HEAD SP (L)
H2 LP
H1 LP
H2 SP
H1 SP
H-AMP. R
H-AMP. L
REC ON
LUMA.
AGC AMP.
C-AGC
C309
C-AMP.
C-OUT
ENV. DET.
ENV. COMP.
Iout LP
Iout SP
EP REC AMP.
SP REC AMP
PB ON
Vin LP
Vin SP
GND
Vmes
VSPLP
CSPLP
TRIV
R307
R351
ATR ENVE. (TO PIN66 OF IC801)
ENVE. DET. (TO PIN84 OF IC801)
FOR 2HEAD MODELS
SP (L) (FROM PIN76 OF IC801)
IC301 STV5715 VIDEO H/A IC
V-MES
ATR ENVE. (TO PIN66 OF IC801)
PB 400mVp-p
2.8V
EQ AMP. Q201-3
PB 250mVp-p
REC 500mVp-p
2.1V
PB-FM IN
H.P.F.
L.P.F.
MIX.
SUB LIM.
LIM.
FM DEM.
SUB L.P.F.
DO DET.
8H CONVERTER
EDGE DETEV
DOC
MUTE
MAIN DE-EMPH.
MAIN EM/DE-EM IN
MAIN EM/DE-EM OUT
R214
R213
C215 //216
C214
ML. ALC
MAIN EMPH. (CARRIER OFFSET) W.C / D.C
FBC/ALC
IC401 HA118201 YC PROCESSOR
fo/DEV.
fo DEV.
C217
TRAP FILTER C240-41,208-10 R225-8
REC-FM OUT
FM MOD.
REC 800mVp-p
3.0V
TP2201
PB-C IN
2MHz L.P.F.
ACC
PB B,50mVp-p 627KHz
REC B,230mVp-p 627KHz
TRAP FILTER L509,C526-8 R513-5
REC-C OUT
COLOUR KILLER
BURST EMPH.
1.3MHz L.P.F.
DELAY 0.15Ω
MAIN CONV. 1
MESECAM DET.
APC SW.
0 / +6dB
APC B.P.F.
APC
PHASE GEN.
ACC DET. (BURST)
C-CCD IC402 1/2
C-CCD DRIVE
VCA
MAIN CONV. 2
BURST DE-EMPH.
NTSC PAL CONVERTOR
C509
L DET.
LEVEL DET.
C-CCD FB IN
2.2MHz L.P.F.
PB/REC DISCRI
REC AFC
REC APC
PB APC
COLOUR KILLER ID DET.
KILLER DET. OUT
BAND GAP
ARITHMETIC
SECAM DET. CARR. SW.
DOWN CONVERTOR
4 PHASE GEN.
1/2 PHASE SW.
MESECAM DET.
S-DET.
1/2 2fL VCO
CR DET. 2fsc
X-TAL VCO / OSC
CLOCK
CK
B.G.
SECAM TANK
S-DET.OUT
S-DET.C
LC VCO
DISCRI
PB AFC REC AFC
2fsc OUT
CR-DET
3.58 /4.43 IN
3.58 OSC OUT
3.58 IN
REC APC
SW30/25
CCD OUT
SSB DATA
SSB CLK
COLOUR 1.1V B/W 2.4V
C514
C522
R511
L507
C523
PAL L SECAM / MESECAM H
C213
PAL 0V MESECAM 5.0V
MESECAM (H) (TO PIN43 OF IC801)
L504
C531
PC 5V
C510
C515
C516
R502
C511
L501
C512
R508
C529
X501 4.43MHz
C521
C520
R510
CCD CLOCK (TO PIN11 OF IC402)
PB/REC 500mVp-p 10.1MHz
0.3Vp-p 8.86MHz PB/REC
2.5V
0.5Vp-p 4.43MHz PB/REC
2.1V
0.7Vp-p 4.43MHz PB/REC
3.6V
PB/REC PAL SW25 NTSC SW30
5.0V
2.5V
0V
C-ROT.
REC/PB 0V PAL 2.5V NT→PAL 5.0V NTSC
NTSC/PAL N→P CONT. OUT
CCD CTL (TO PIN9 OF IC402)
SERIAL CONT. INTERFACE
Vth= 2.8V "H" 1.0V "L"
Y/C CLOCK (FROM PIN3 OF IC801)
Y/C DATA (FROM PIN2 OF IC801)
CHROMA ROTATION (FROM PIN82 OF IC801)
PAL LP (H) (FROM PIN2 OF IC5001)
HEAD AMP. SW. (FROM PIN83 OF IC801)
Q504 JOG SW.
E-PEAK
REC ME FBC PB APL
P-CONT
NC FILTER
CRAMP DRIVE
CRAMP IN
YNR DC
Y-CCD DRIVE
CCD ADJ
Y-CCD CLAMP
AGC DET.
LINE2 IN AUX IN
LINE1 IN TUNER IN
C212
R212 C211 L205
C218
R215 C219
C221
C220
C223
C224
PB 250mVp-p
PB/REC 500mVp-p
0.6V
Y-CCD IC402 1/2
EQ AMP. Q204-5
NOISE CANCEL
PICTURE CONTROL
CLAMP
VCA
Y.N.R.
DO/REC
DO
PB 500mVp-p
N.L. EMPH.
N.L. DE-EMPH.
DETAIL EMPH. (PB THROUGH)
SYNC. SEP.
AGC DET.
VIDEO AGC
REC 400mVp-p
Y-L.P.F.
PB VCA
REC 500mVp-p
PB 500mVp-p
ATT. (-10dB)
ATT. (-10dB)
REC/EE 1.0Vp-p
1.0V
REC/EE 300mVp-p
REC/EE 500mVp-p
6dB AMP.
VIDEO ALC
FEAD BACK CLAMP
F.B.C.
ALC
C226
C228
SQUELCH 6dB AMP.
SQ IN
FV (FROM PIN23 OF IC801)
YC MIX.
VIDEO OUT
OSD BLOCK
KILLER 6dB AMP.
C-IN
REC/EE 2.0Vp-p
1.3V
B.P.F.
B.P.F. TRAP
L506
C517 //518
C519
OUT
REC/PB 5.0V 0V
ACC DET.
C513
COLOUR 1.4V B/W 2.5V
PB-C OUT
CNR COLOUR KILLER
PB B,300mVp-p 4.43MHz
PB B,377.6mVp-p 4.43MHz
CNR FB IN
N.C.
Y-Vcc
C-Vcc
Y-GND
C-GND
PC5V
PB/REC 5.0V 0V
TP1502
FROM IF PACK PIN2 OF UNT1551
IC2251 MM1115XF DECODER VIDEO SW
6dB
SW
AUX2 (H) (FROM PIN78 OF IC801)
J2201 VIDEO IN AUX2
J2201 VIDEO IN AUX1
SC2201
V.GND 17
GND 18
V.OUT 19
V.IN 20
GND 21
J2201 VIDEO OUT
Q1202 E.F.
IC1201 MM1116XF DECODER VIDEO SW
Q4401 E.F.
BO/DECODER CTL (FROM PIN6 OF IC801)
TO RF CONVERTOR PIN1 OF CNV4451
COMPOSIT SYNC. (TO PIN64 OF IC801)

AUDIO BLOCK DIAGRAM


Playback Signal
Recording Signal
E-E Signal
(FROM PINS2,6 OF SC2201) AUDIO IN
J2301 AUX 1 AUDIO IN
SC2301 AUX 2 AUDIO IN
(FROM PIN78 OF IC801) AUX 2(H)
(FROM PIN7 OF IF PAC) TUNER AUDIO IN
(FROM PIN77 OF IC801) EE (L)
(FROM PIN79 OF IC801) AUX (H)
TO PIN2 OF RF CONVERTER
TO PIN1 OF IC1202
J2201 AUDIO OUTPUT
-8.0dBs
Line mute switch control
(FROM PIN75 OF IC801) AUDIO MUTE
(FROM PIN41 OF IC801) BIAS CTL (H)
(FROM PIN76 OF IC801) SP (L)
SW1 ~ SW3 Control
SW4 ~ SW6 Control
(FROM COLLECTOR OF Q958) PC 9V
(FROM COLLECTOR OF Q956) BIAS CTL 9V
AUDIO BUFFER Q602
AUDIO L.P.F. Q601
Q6651 INV.
Q6654 INV.
Q6652 SW
Q6653 SW
LINE MUTE SW
BUF.
LINE MUTE
ALC
BIAS
REC
PB
IC601 BA7795LS AUDIO SIGNAL PROCESSOR
SW7, SW8 Control
-7.5dBs
-27.5dBs
-35.5dBs
-6.5dBs
-66.5dBs
R634 BIAS CURRENT ADJ.
BIAS OSC T601 Q603
TP601 (+)
TP602 (-)
AUDIO HEAD(PB)
AUDIO HEAD(REC)
AE HEAD
FE HEAD
GND
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD

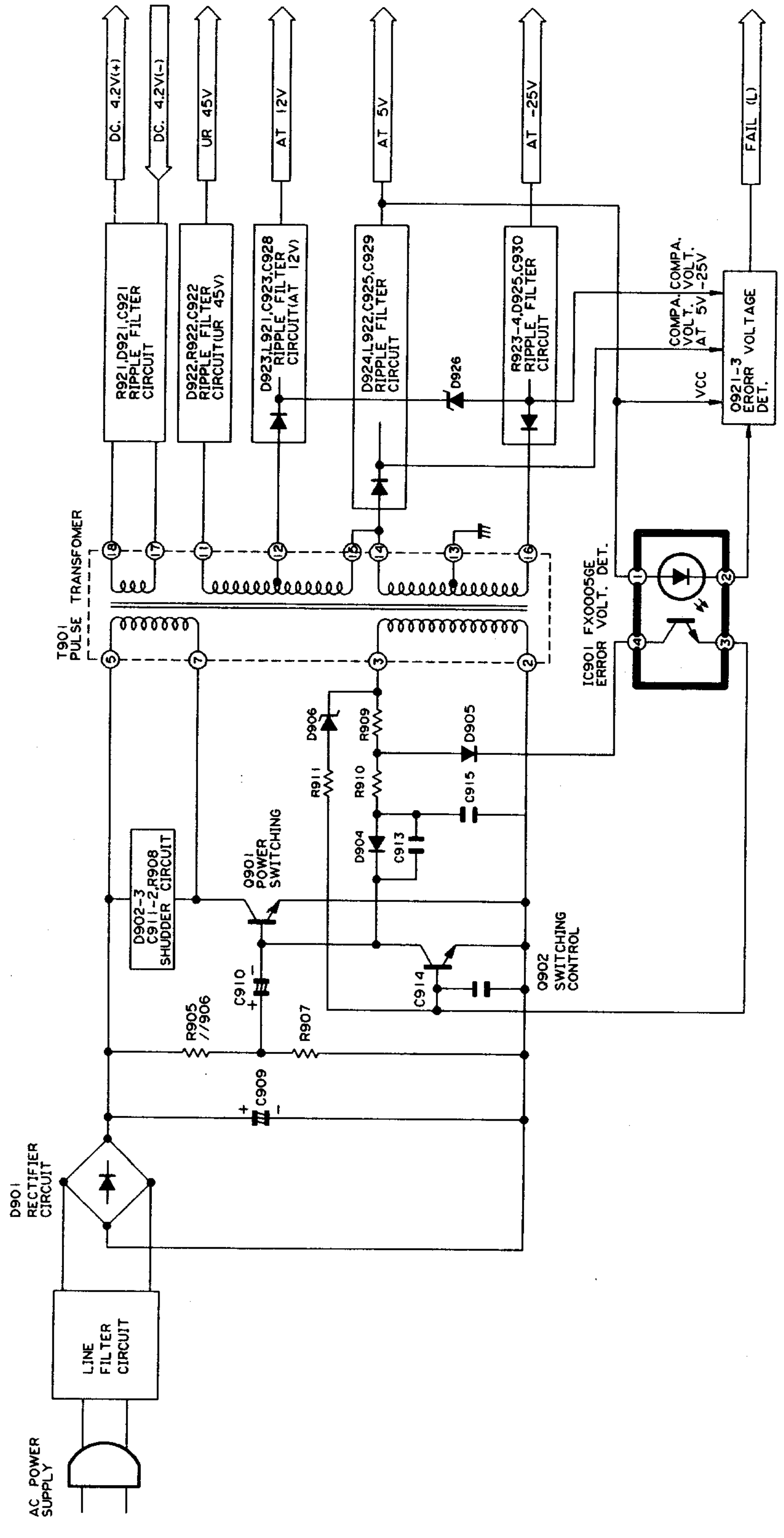
⑰ pin terminal Voltage	Line mute switch
0 ~ 2.0V	OFF
3.5 ~ 7.0V	ON

㉔ pin terminal Voltage	MODE	SW1	SW2	SW3
0 ~ 1.0V	REC	OFF	ON	OFF
4.3 ~ 7.0V	REC	ON	OFF	ON

⑨ pin terminal Voltage	SW4	SW5	SW6
0 ~ 1.0V	ON	OFF	OFF
4.3 ~ 7.0V	OFF	ON	ON

⑪ pin terminal Voltage	MODE	SW7	SW8
0 ~ 1.0V	TUNER	E-E	TUNER
2.2 ~ 2.7V	LINE	E-E	LINE
4.3 ~ 7.0V	PB	PB	—

POWER CIRCUIT BLOCK DIAGRAM


DC 4.2V(+)
DC 4.2V(-)
UR 45V
AT 12V
AT 5V
AT -25V
FAIL (L)
R921,D921,C921 RIPPLE FILTER CIRCUIT
D922,R922,C922 RIPPLE FILTER CIRCUIT(UR 45V)
D923,L921,C923,C928 RIPPLE FILTER CIRCUIT(AT 12V)
D924,L922,C925,C929 RIPPLE FILTER CIRCUIT
R923-4,D925,C930 RIPPLE FILTER CIRCUIT
D926
COMPA. VOLT. AT 5V
COMPA. VOLT. -25V
VCC
Q921-3 ERORR VOLTAGE DET.
T901 PULSE TRANSFOMER
IC901 FX0005GE ERROR VOLT. DET.
D906
R909
D905
R911
R910
C915
D904
C913
Q901 POWER SWITCHING
D902-3 C911-2,R908 SHUDDER CIRCUIT
C910
C914
Q902 SWITCHING CONTROL
R905 /906
R907
C909
D901 RECTIFIER CIRCUIT
LINE FILTER CIRCUIT
AC POWER SUPPLY

MEMO

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE:
BE SURE TO USE GENUINE PARTS FOR SECURING THE SAFETY AND RELIABILITY OF THE SET. PARTS MARKED WITH "⚠" AND PARTS SHADED (IN BLACK) ARE ESPECIALLY IMPORTANT FOR MAINTAINING THE SAFETY AND PROTECTING ABILITY OF THE SET.
BE SURE TO REPLACE THEM WITH PARTS OF SPECIFIED PART NUMBER.

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

NOTES:

1. *The unit of resistance "ohm" is omitted (k = 1000 ohm, M = 1 Meg ohm).*
2. *All resistors are 1/8 watt, unless otherwise noted.*
3. *The unit of capacitance "F" is omitted (μ = μF, p = μμF).*
4. *The values in parentheses are the ones in the PB mode; the values without parentheses are the ones in the REC mode.*

VOLTAGE MEASUREMENT CONDITIONS:

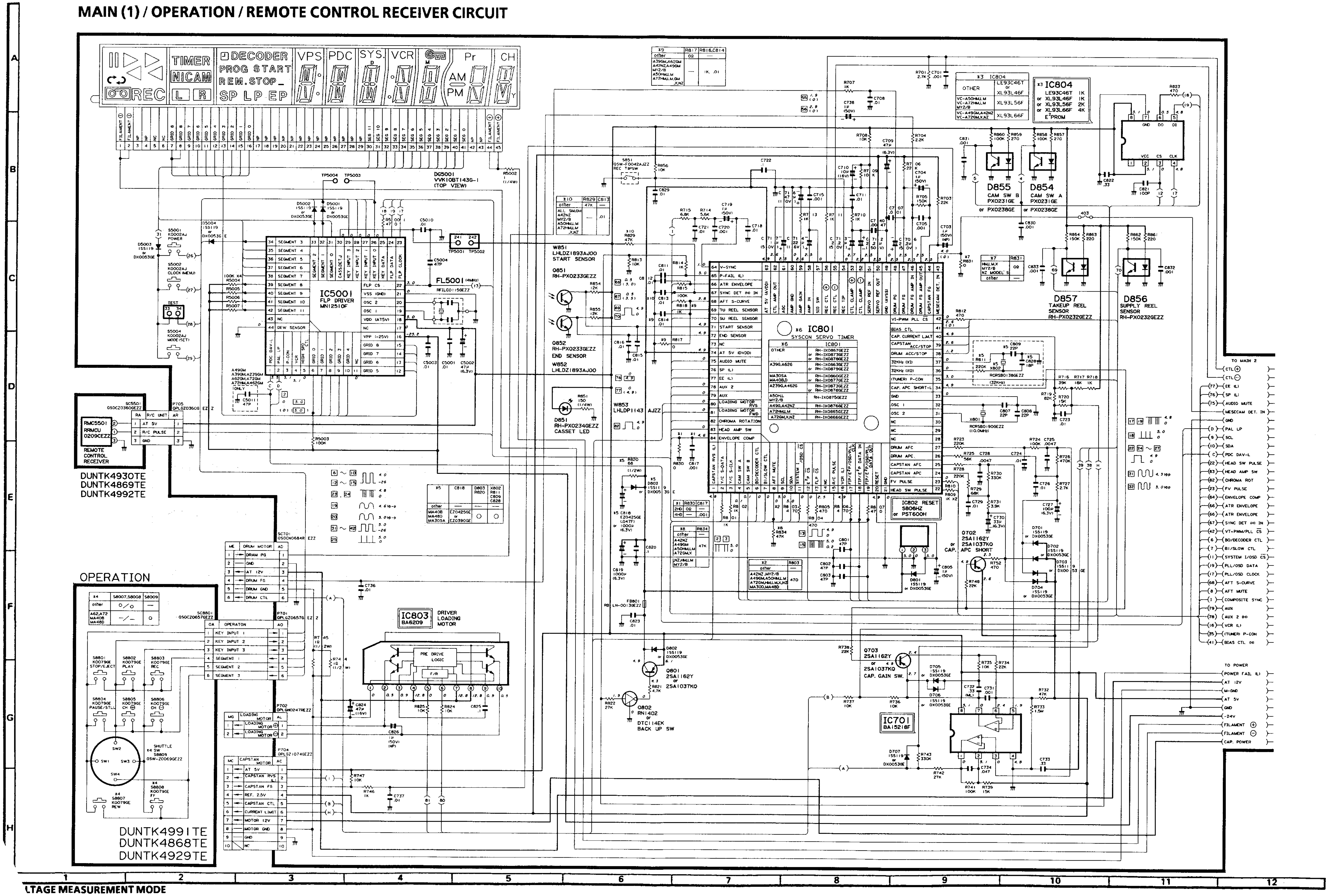
1. *DC voltages are measured between points indicated and chassis ground by VTVM, with AC240V/220V, 50Hz supplied to unit and all controls are set to normal viewing picture unless otherwise noted.*
2. *Voltages are measured with 10000μV B & W or colour signal.*

WAVEFORM MEASUREMENT CONDITIONS:
10000μV 87.5 percent modulated colour bar signal is fed into tuner.

CAUTION:
This circuit diagram is original one. Therefore there may be a slight difference from yours.

9. CIRCUIT DIAGRAM AND PWB FOIL PATTERN

MAIN (1) / OPERATION / REMOTE CONTROL RECEIVER CIRCUIT

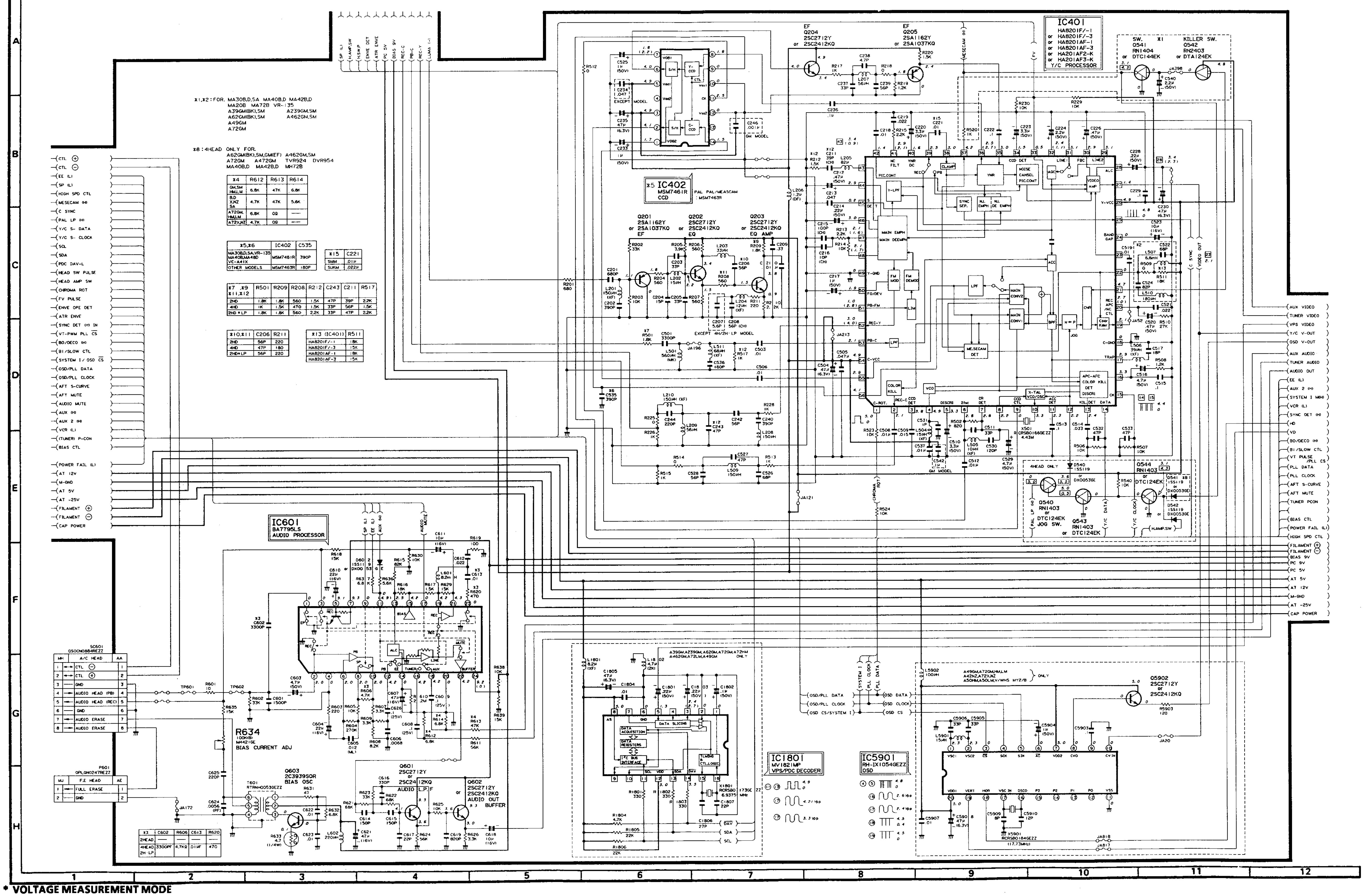

TIMER
NICAM
DECODER
PROG START
REM. STOP
SP LP EP
VPS
PDC
SYS.
VCR
Pr
CH
AM
PM
REC
DG5001
VVK10BT143G-1
(TOP VIEW)
TP5004
TP5003
IC5001
FLP DRIVER
MN12510F
FL5001
TP5001
TP5002
S5001
POWER
S5002
CLOCK (MENU)
S5004
MODE (SET)
TEST
D5001
D5002
D5003
D5004
RMC5501
RRMCU
0209CEZZ
REMOTE
CONTROL
RECEIVER
DUNTK4930TE
DUNTK4869TE
DUNTK4992TE
OPERATION
S8801 STOP/EJECT
S8802 PLAY
S8803 REC
S8804 PAUSE/STILL
S8805 CH ⊕
S8806 CH ⊖
S8807 REW
S8808 FF
S8809 SHUTTLE
DUNTK4991TE
DUNTK4868TE
DUNTK4929TE
DRUM MOTOR
CAPSTAN MOTOR
LOADING MOTOR
OPERATION
IC803
BA6209
DRIVER
LOADING
MOTOR
PRE DRIVE LOGIC
IC801
SYSCON SERVO TIMER
IC802 RESET
S806HZ
or PST600H
IC804
E²PROM
IC701
BA15218F
D855
CAM SW B
PX0231GE
or PX0238GE
D854
CAM SW A
PX0231GE
or PX0238GE
D857
TAKEUP REEL
SENSOR
RH-PX0232GEZZ
D856
SUPPLY REEL
SENSOR
RH-PX0232GEZZ
W851
LHLDZ1893AJ00
START SENSOR
Q851
RH-PX0233GEZZ
Q852
RH-PX0233GEZZ
END SENSOR
W852
LHLDZ1893AJ00
D851
RH-PX0234GEZZ
CASSET LED
W853
LHLDP1143 AJZZ
S851
REC TIPSW
Q801
2SA1162Y
or
2SA1037K0
Q802
RN1402
or
DTC114EK
BACK UP SW
Q702
2SA1162Y
2SA1037K0
APC SHORT
Q703
2SA1162Y
or
2SA1037K0
CAP. GAIN SW.
TO MAIN 2
TO POWER
POWER FAIL
AT 12V
M-GND
AT 5V
GND
-24V
FILAMENT ⊕
FILAMENT ⊖
CAP. POWER

LTAGE MEASUREMENT MODE

… Parentheses ( )

…. Without Parentheses

MAIN (2) CIRCUIT



※1,※2 : FOR. MA30B,D,SA MA40B,D MA42B,D
MA20B MA72B VR-135
A39GM(BK),SM A239GM,SM
A62GM(BK),SM A462GM,SM
A49GM
A72GM

※8 : 4HEAD ONLY FOR.
A62GM(BK),SM,GM(EF) A462GM,SM
A72GM A472GM TVR924 DVR954
MA40B,D MA42B,D MH72B

※4	R612	R613	R614
GM,SM HM,LM	6.8K	47K	6.8K
B,D X,NZ SA	4.7K	47K	5.6K
A72GM, HM,LM	6.8K	0Ω	——
A72X,NZ	4.7K	0Ω	——

※5,※6	IC402	C535
MA30B,D,SA,VR-135 MA40B,MA48D VC-A41X	MSM7461R	390P
OTHER MODELS	MSM7463R	180P

※15	C221
SMM	.01μ
SUKM	.022μ

※7 ,※9 ※11,※12	R501	R209	R208	R212	C243	C211	R517
2HD	1.8K	1.8K	560	1.5K	47P	39P	2.2K
4HD	1K	1.5K	470	1.5K	33P	56P	1.5K
2HD • LP	1.8K	1.8K	560	2.2K	33P	47P	2.2K

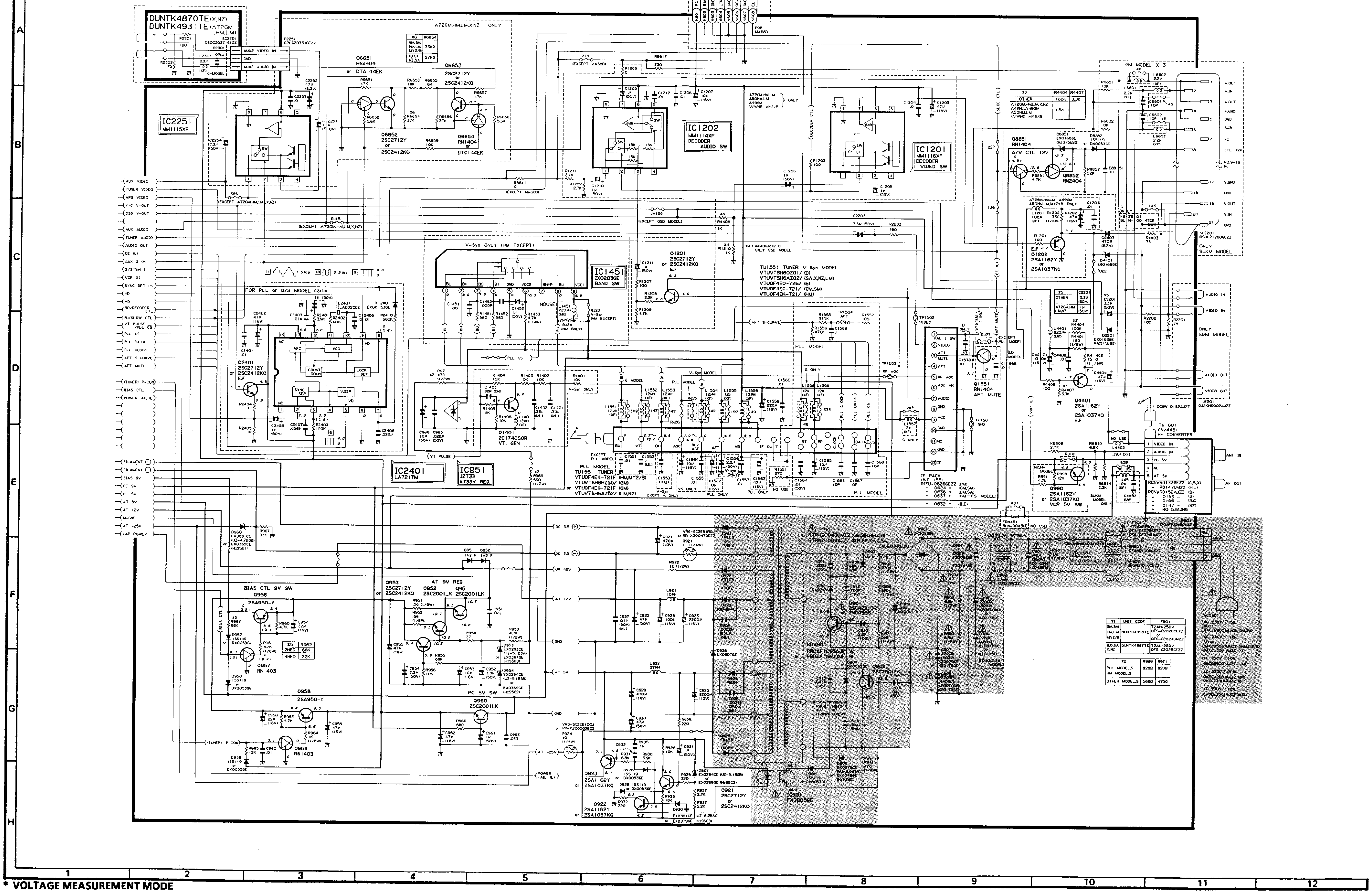
※10,※11	C206	R211
2HD	56P	220
4HD	47P	180
2HD•LP	56P	220

※13 (IC401)	R511
HA8201F/-1	18K
HA8201F/-3	15K
HA8201AF-1	18K
HA8201AF-3	15K

※3	C602	R606	C613	R620
2HEAD	——	——	——	——
4HEAD 2H · LP	3300PF	4.7KΩ	.01μF	470

*** VOLTAGE MEASUREMENT MODE**
PB .... Parentheses ( )
REC ...... Without Parentheses

MAIN (3) CIRCUIT


DUNTK4870TE (X,NZ)
DUNTK4931TE (A72GM,HM,LM)
IC2251
MM1115XF
IC1202
MM1114XF
DECODER AUDIO SW
IC1201
MM1116XF
DECODER VIDEO SW
IC1451
IX0203GE
BAND SW
IC2401
LA7217M
IC951
UZT33
AT33V REG.
Q6851
RN1404
A/V CTL 12V
Q6852
RN2404
Q1201
2SC2712Y
or
2SC2412KO
E.F
Q1202
2SA1162Y
or
2SA1037KQ
Q1551
RN1404
AFT MUTE
Q4401
2SA1162Y
or
2SA1037KQ
E.F
Q990
2SA1162Y
or
2SA1037KQ
VCR 5V SW
Q2401
2SC2712Y
or
2SC2412KO
E.F
Q1401
2C1740SQR
VT. GEN
BIAS CTL 9V SW
Q956
2SA950-Y
Q957
RN1403
Q958
2SA950-Y
Q959
RN1403
Q953
2SC2712Y
or
2SC2412KO
Q952
2SC2001LK
Q951
2SC2001LK
AT 9V REG
Q960
2SC2001LK
PC 5V SW
Q923
2SA1162Y
or
2SA1037KQ
Q922
2SA1162Y
or
2SA1037KQ
Q921
2SC2712Y
or
2SC2412KO
Q901
2SC4231OR
or
2SC4908
Q902
2SC2001LK
IC901
FX0005GE
T901
D901
Q6651
RN2404
or
DTA144EK
Q6652
2SC2712Y
or
2SC2412KO
Q6653
2SC2712Y
or
2SC2412KO
Q6654
RN1404
or
DTC144EK
TU1551 TUNER V-Syn MODEL
VTUVTSH6020I/ (D)
VTUVTSH6AZ02/ (SA,X,NZ,LM)
VTUF4EQ-726/ (B)
VTUF4EG-721/ (GM,SM)
VTUF4EK-721/ (HM)
PLL MODEL
TU1551 TUNER
VTUF4EK-721F (HM,MY2/B)
VTUVTSH6HZ50/ (GM)
VTUF4EG-721F (GM)
VTUVTSH6AZ52/ (LM,NZ)
FOR PLL or G/S MODEL
V-Syn ONLY (HM EXCEPT)
IF PACK
UNIT 1551
TU OUT
CNV4451
RF CONVERTER
AUX VIDEO
TUNER VIDEO
VPS VIDEO
Y/C V-OUT
OSD V-OUT
AUX AUDIO
TUNER AUDIO
AUDIO OUT
EE (L)
AUX 2 (H)
SYSTEM I
VCR (L)
SYNC DET (H)
HD
VD
BD/DECODER CTL
BI/SLOW CTL
VT PULSE /PLL CS
PLL CS
PLL DATA
PLL CLOCK
AFT S-CURVE
AFT MUTE
(TUNER) P-CON
BIAS CTL
POWER FAIL(L)
FILAMENT
BIAS 9V
PC 9V
PC 5V
AT 5V
AT 12V
M-GND
AT -25V
CAP POWER
DC 35
UR 45V
AT 12V
GND
AT 5V
AT -25V
POWER FAIL (L)
AUDIO IN
VIDEO IN
AUDIO OUT
VIDEO OUT
ANT IN
RF OUT
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

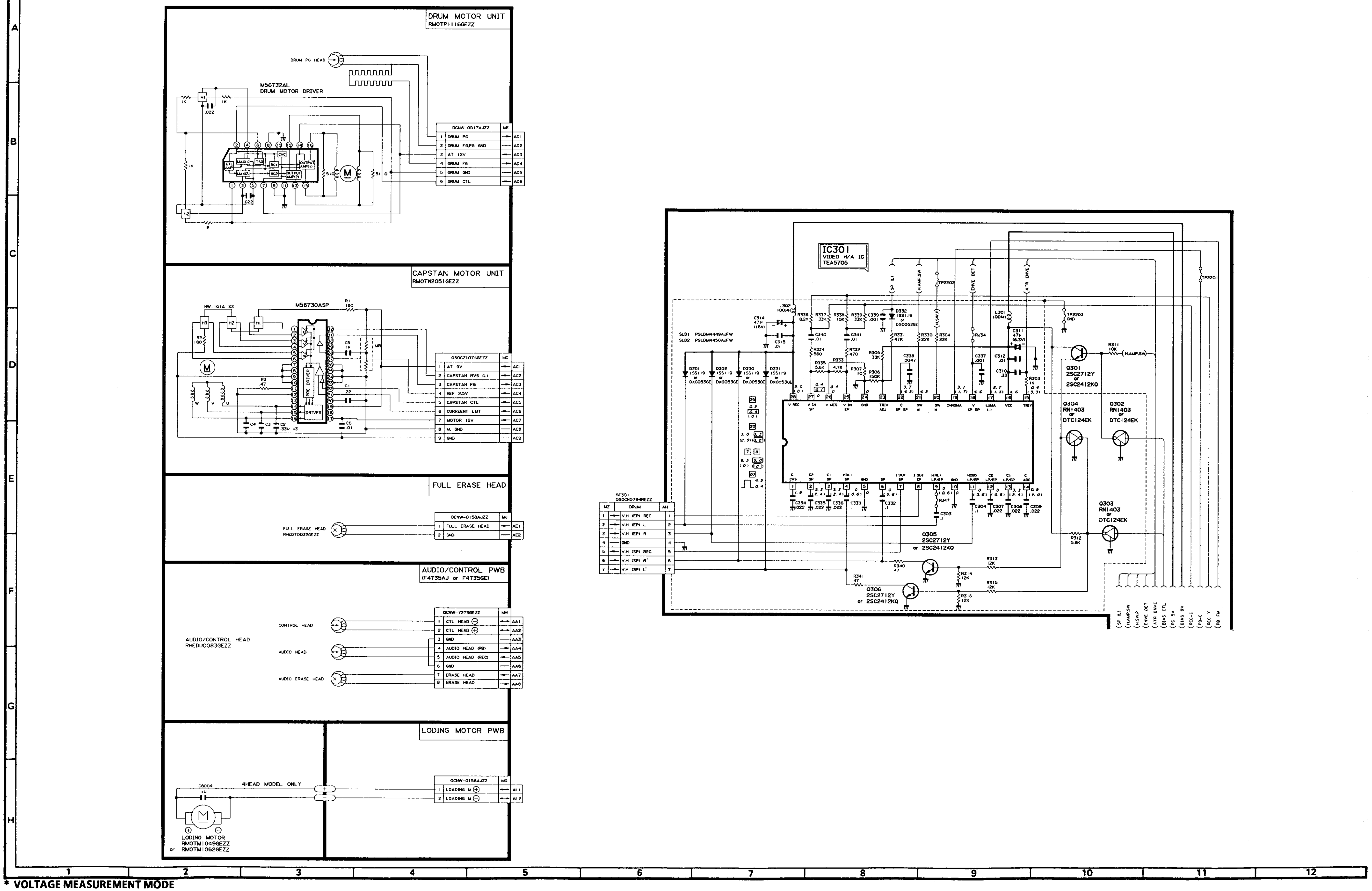
*** VOLTAGE MEASUREMENT MODE**

PB .... Parentheses ( )

REC ...... Without Parentheses

VC-A72HM
VC-A72LM

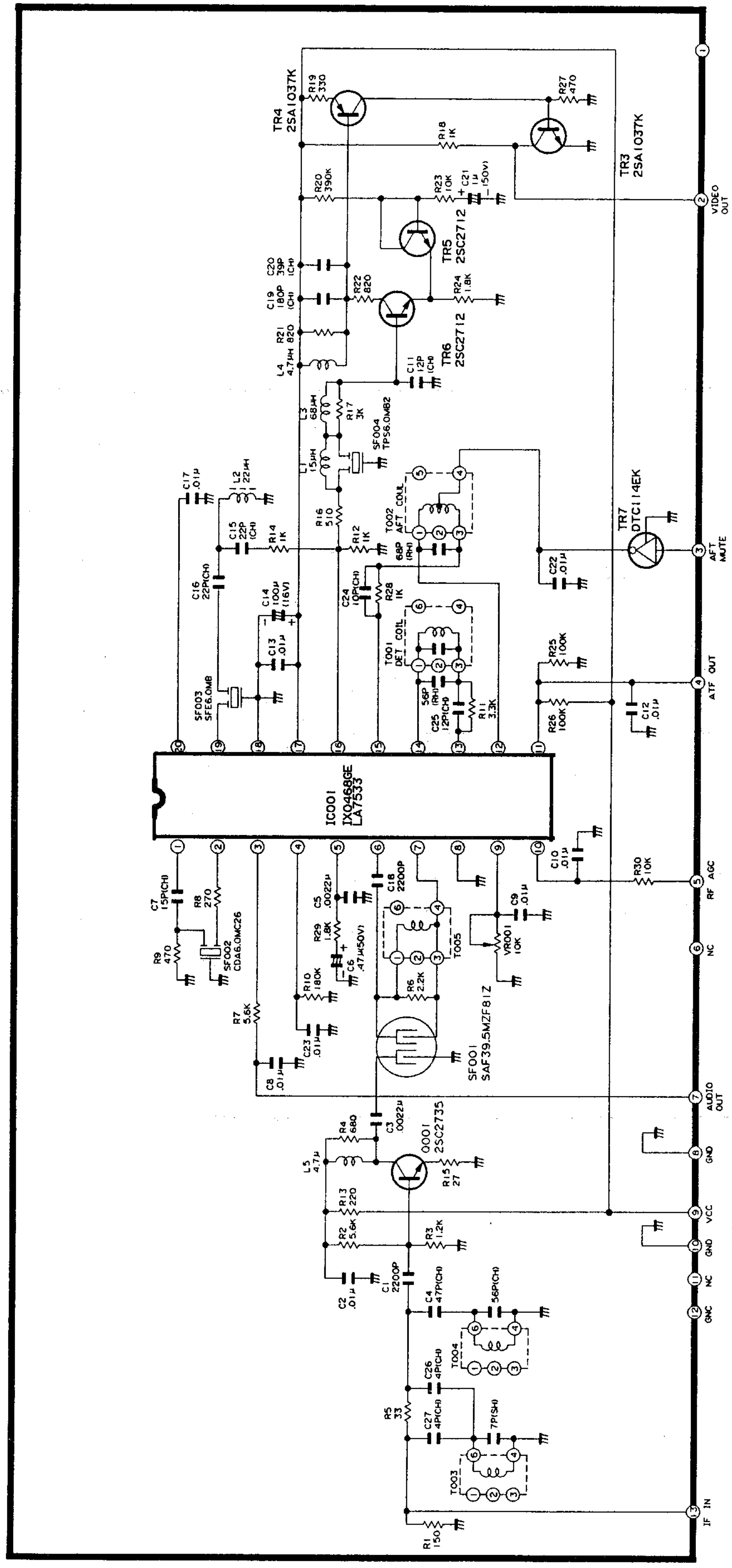
MAIN (4) CIRCUIT


A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12
DRUM MOTOR UNIT
RMOTP1116GEZZ
DRUM PG HEAD
M56732AL
DRUM MOTOR DRIVER
QCNW-0517AJZZ
ME
1 DRUM PG AD1
2 DRUM FG,PG GND AD2
3 AT 12V AD3
4 DRUM FG AD4
5 DRUM GND AD5
6 DRUM CTL AD6
CAPSTAN MOTOR UNIT
RMOTN2051GEZZ
HW-101A x3
M56730ASP
R1
180
0SOCZ1074GEZZ
MC
1 AT 5V AC1
2 CAPSTAN RVS (L) AC2
3 CAPSTAN FG AC3
4 REF 2.5V AC4
5 CAPSTAN CTL AC5
6 CURREENT LMT AC6
7 MOTOR 12V AC7
8 M. GND AC8
9 GND AC9
FULL ERASE HEAD
FULL ERASE HEAD
RHEDT0032GEZZ
QCNW-0158AJZZ
MJ
1 FULL ERASE HEAD AE1
2 GND AE2
AUDIO/CONTROL PWB
(F4735AJ or F4735GE)
AUDIO/CONTROL HEAD
RHEDU0083GEZZ
CONTROL HEAD
AUDIO HEAD
AUDIO ERASE HEAD
QCNW-7273GEZZ
MH
1 CTL HEAD ⊖ AA1
2 CTL HEAD ⊕ AA2
3 GND AA3
4 AUDIO HEAD (PB) AA4
5 AUDIO HEAD (REC) AA5
6 GND AA6
7 ERASE HEAD AA7
8 ERASE HEAD AA8
LODING MOTOR PWB
C8004
4HEAD MODEL ONLY
QCNW-0156AJZZ
MG
1 LOADING M ⊕ AL1
2 LOADING M ⊖ AL2
LODING MOTOR
RMOTM1049GEZZ
or RMOTM1062GEZZ
IC301
VIDEO H/A IC
TEA5705
SC301
QSOCN0794REZZ
MZ
DRUM
AH
1 V.H (EP) REC 1
2 V.H (EP) L 2
3 V.H (EP) R 3
4 GND 4
5 V.H (SP) REC 5
6 V.H (SP) R' 6
7 V.H (SP) L' 7
SLD1 PSLDM4449AJFW
SLD2 PSLDM4450AJFW
Q301
2SC2712Y
or
2SC2412KQ
Q302
RN1403
or
DTC124EK
Q303
RN1403
or
DTC124EK
Q304
RN1403
or
DTC124EK
Q305
2SC2712Y
or 2SC2412KQ
Q306
2SC2712Y
or 2SC2412KQ
TP2201
TP2202
TP2203
GND
(SP (L)
(H.AMP.SW
(H.SW.P
(ENVE DET
(ATR ENVE
(BIAS CTL
(PC 5V
(BIAS 9V
(REC-C
(PB-C
(REC Y
(PB FM

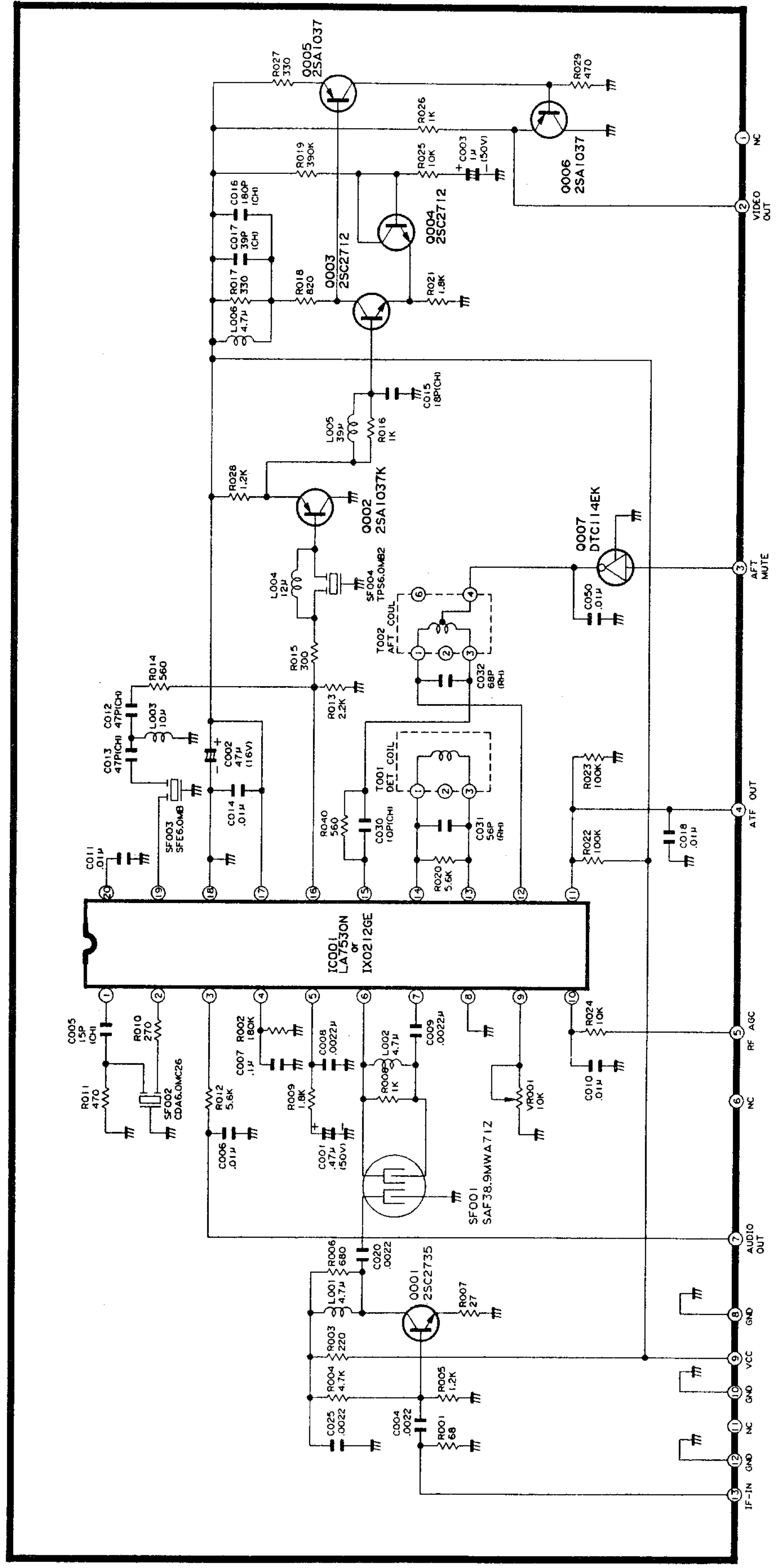
* VOLTAGE MEASUREMENT MODE
PB .... Parentheses ( )
REC ...... Without Parentheses

IF PACK CIRCUIT

VC-A72HM: RIFU-0637GEZZ


TR4 2SA1037K
TR3 2SA1037K
TR5 2SC2712
TR6 2SC2712
TR7 DTC114EK
IC001 IX0468GE LA7533
T001 DET COIL
T002 AFT COIL
SF001 SAF39.5MZF81Z
SF002 CDA6.0MC26
SF003 SFE6.0MB
SF004 TPS6.0MB2
Q001 2SC2735
VR001 10K
T003
T004
T005
VIDEO OUT
AFT MUTE
ATF OUT
MUTE
RF AGC
NC
AUDIO OUT
GND
VCC
GND
NC
GND
IF IN

VC-A72LM: RIFU-0636GEZZ


Q005 2SA1037
Q006 2SA1037
Q004 2SC2712
Q003 2SC2712
Q002 2SA1037K
Q007 DTC114EK
IC001 LA7530N or IX0212GE
T001 DET COIL
T002 AFT COIL
SF001 SAF38.9MWA71Z
SF002 CDA6.0MC26
SF003 SFE6.0MB
SF004 TPS6.0MB2
Q001 2SC2735
VR001 10K
NC
VIDEO OUT
AFT MUTE
ATF OUT
RF AGC
NC
AUDIO OUT
GND
VCC
GND
NC
GND
IF-IN

10. REPLACEMENT PARTS LIST

PARTS REPLACEMENT

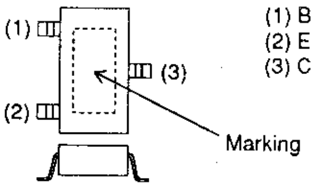
Many electrical and mechanical parts in video cassette recorder have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by⚠ and shaded areas in the Replacement Parts Lists and Sche matic Diagrams. The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER	**2. REF. NO.**
3. PART NO.	**4. DESCRIPTION**
5. PRICE CODE	

HOW TO IDENTIFY CHIP TRANSISTORS AND DIODES BY ITS MARKING



(1) Base/Input
(2) Emitter/Ground
(3) Collector/Output

Fig. 1

Package	Marking	Parts No.
Fig. 1	15	VSDTA124EK/-1
Fig. 1	25	VSDTC124EK/-1
Fig. 1	24	VSDTC114EK/-1
Fig. 1	26	VSDTC144EK/-1
Fig. 1	16	VSDTA144EK/-1
Fig. 1	BQ	VS2SC2412KQ-1

MARK ★: SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code

PRINTED WIRING BOARD ASSEMBLIES

(NOT REPLACEMENT ITEM)

DUNTK4928TEVC - Main Unit (VC-A72HM) —
DUNTK4928TEVE - Main Unit (VC-A72LM) —
DUNTK4929TEV0 - Operation Unit —
DUNTK4930TEV1 - R/C Receiver Unit —
DUNTK4931TEV0 - Front A/V Unit —

DUNTK4928TEVC (VC-A72HM) DUNTK4928TEVE (VC-A72LM)

MAIN UNIT ASSEMBLY

TUNER AND ASSEMBLY

Ref. No.	Part No.	★	Description	Code
CNV4451	RCNVR0147UMZZ	U	RF Converter	BB
TU1551	VTUOF4EK-721F	J	Tuner (VC-A72HM)	AZ
TU1551	VTUVTSH6AZ52/	J	Tuner (VC-A72LM)	BE
UNT1551	RiFU-0637GEZZ	J	IF-Pack (VC-A72HM)	BA
UNT1551	RiFU-0636GEZZ	J	IF-Pack (VC-A72LM)	BA

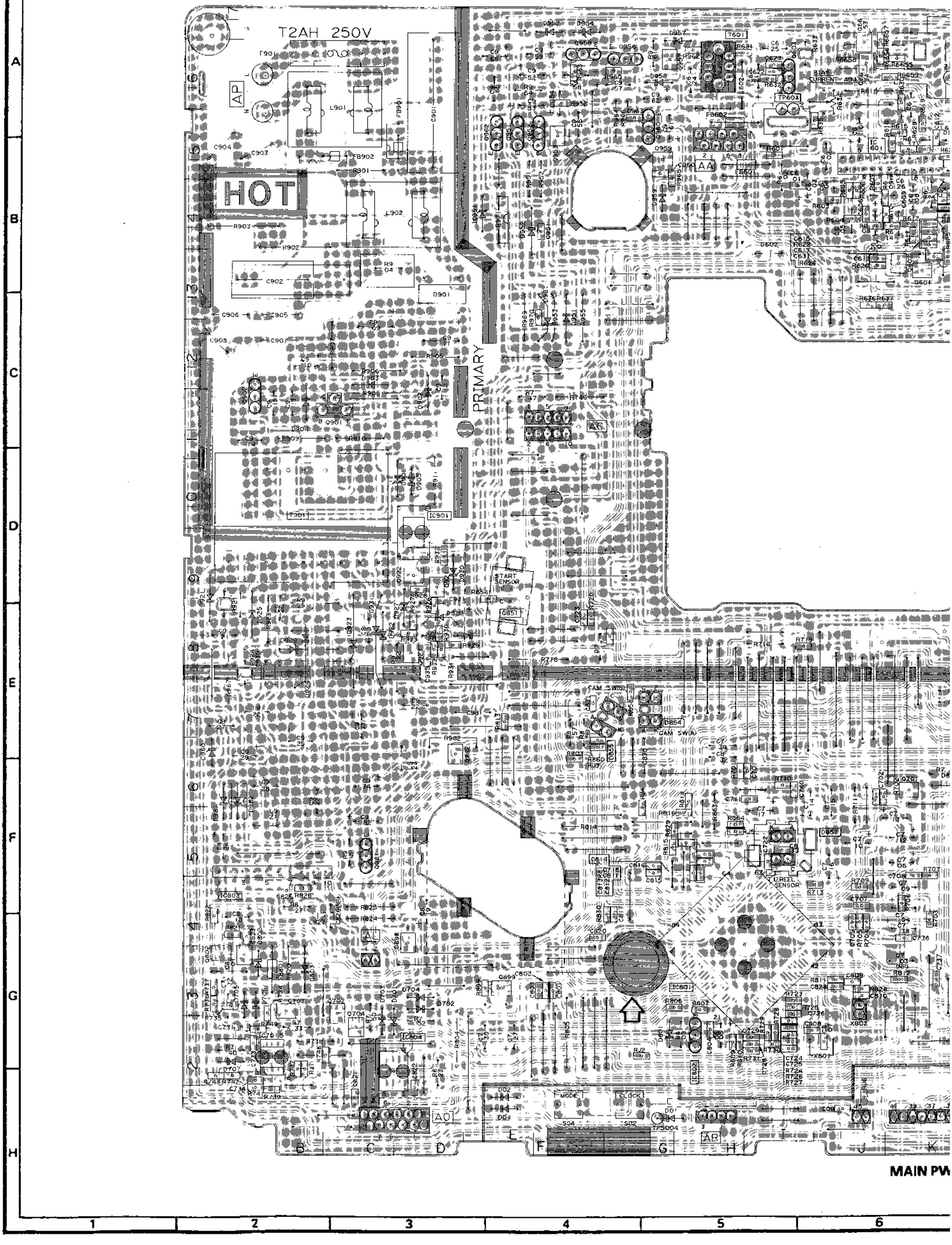
INTEGRATED CIRCUITS

Ref. No.	Part No.	★	Description	Code
IC301	VHiTEA5705/-1	J	Video H/A	AL
IC401	VHiHA8201AF-3	J	Y/C Processor	AS
IC402	VHiMSM7463R-1	J	CCD	AM
IC601	VHiBA7795LS-1	J	Audio Processor	AG
IC701	VHiBA15218F1E	J		AF
IC801	RH-iX0865GEZZ	J	Syscon/Servo/Timer	BC
IC802	VHiS806HZ//-1	J	Reset	AC
IC803	VHiBA6209//1E	J	Loading Motor Driver	AG
IC804	VHiXL93L56F-1	U	E²PROM	AM
IC951	VHiUZT33///-1	J	AT 33V Regulator	AC
IC1201	VHiMM1116XF1E	J	Decoder Video Switch	AG
IC1202	VHiMM1114XF1E	J	Decoder Audio Switch	AH
IC1801	VHiMV1821MP-1	J	VPS/PDC Decoder	AW
IC2251	VHiMM1115XF1E	U		AF
IC2401	VHiLA7217M/-1	J		AG
IC5001	VHiMN12510F-1	J	FLP Driver	AM
IC5901	RH-iX1054GEZZ	J	OSD	AM

TRANSISTORS

Ref. No.	Part No.	★	Description	Code
Q201	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q202	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q203	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q204	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q205	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q301	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q302	VSDTC124EK/-1	J	DTC124EK	AB
Q303	VSDTC124EK/-1	J	DTC124EK	AB
Q304	VSDTC124EK/-1	J	DTC124EK	AB
Q305	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q306	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q601	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q602	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q603	VS2C3939SQR1E	J	2SC3939SQR	AC
Q702	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q703	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q801	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q802	VSDTC114EK/-1	J	DTC114EK	AB
⚠Q901	VS2SC4231QR-3	J	2SC4231QR	AG
⚠Q902	VS2SC2001LK-1	J	2SC2001LK	AA
Q921	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q922	VS2SA1037KQ-1	J	2SA1037KQ	AA

PWB FOIL PATTERN


T2AH 250V
HOT
PRIMARY
START SENSOR
AP
AA
AC
AL
AO
AR
CAM SW(B)
CAM SW(A)
REEL SENSOR
BIAS CURRENT ADJ
MODE
CLOCK
A
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MAIN PW

TRANSISTORS(Continued)

Ref. No.	Part No.	★	Description	Code
Q923	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q540	VSDTC124EK/-1	J	DTC124EK	AB
Q543	VSDTC124EK/-1	J	DTC124EK	AB
Q544	VSDTC124EK/-1	J	DTC124EK	AB
Q951	VS2SC2001LK-1	J	2SC2001LK	AA
Q952	VS2SC2001LK-1	J	2SC2001LK	AA
Q953	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q956	VS2SA950-Y/1E	J	2SA950	AD
Q957	VSDTC124EK/-1	J	DTC124EK	AB
Q958	VS2SA950-Y/1E	J	2SA950	AD
Q959	VSDTC124EK/-1	J	DTC124EK	AB
Q960	VS2SC2001LK-1	J	2SC2001LK	AA
Q990	VS2SA1037KQ-1	J	2SA1037KQ (VC-A72HM)	AA
Q1201	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q1202	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q2401	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q4401	VS2SA1037KQ-1	J	2SA1037KQ	AA
Q5902	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q6651	VSDTA144EK/-1	J	DTA144EK	AC
Q6652	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q6653	VS2SC2412KQ-1	J	2SC2412KQ	AA
Q6654	VSDTC144EK/-1	J	DTC144EK	AB
Q8851	VSDTC144EK/-1	J	DTC144EK	AB
Q8852	VSDTA144EK/-1	J	DTA144EK	AC

DIODES

Ref. No.	Part No.	★	Description	Code
D301	RH-DX0053GEZZ	J		AA
D302	RH-DX0053GEZZ	J		AA
D330	RH-DX0053GEZZ	J		AA
D331	RH-DX0053GEZZ	J		AA
D332	RH-DX0053GEZZ	J		AA
D540	RH-DX0053GEZZ	J		AA
D542	RH-DX0053GEZZ	J		AA
D602	RH-DX0053GEZZ	J		AA
D701	RH-DX0053GEZZ	J		AA
D702	RH-DX0053GEZZ	J		AA
D703	RH-DX0053GEZZ	J		AA
D704	RH-DX0053GEZZ	J		AA
D705	RH-DX0053GEZZ	J		AA
D706	RH-DX0053GEZZ	J		AA
D707	RH-DX0053GEZZ	J		AA
D801	RH-DX0053GEZZ	J		AA
D802	RH-DX0053GEZZ	J		AA
D851	RH-PX0234GEZZ	J	Photo Diode	AD
D854	RH-PX0231GEZZ	J	GP1S24	AF
D855	RH-PX0231GEZZ	J	GP1S24	AF
D856	RH-PX0232GEZZ	J	Photo Diode	AF
D857	RH-PX0232GEZZ	J	Photo Diode	AF
⚠D901	RH-DX0083GEZZ	J	Diode	AC
⚠D902	VHDERA2206/-1	J	ERA2206	AC
⚠D903	RH-DX0220CEZZ	J	Diode	AB
⚠D904	RH-DX0052GEZZ	J	Diode	AB
⚠D905	RH-DX0053GEZZ	J		AA

DIODES (Continued)

Ref. No.	Part No.	★	Description	Code
⚠D906	RH-EX0279CEZZ	J	UZ3.0BSA	AA
⚠D921	VHDFR103///-1	J	FR103	AC
⚠D922	VHDFR103///-1	J	FR103	AC
⚠D923	VHD30DF2-FC-1	J	30DF2-FC	AE
⚠D924	VHDRK34////-1	J	RK34	AE
⚠D925	VHDFR103///-1	J	FR103	AC
D926	RH-EX0807GEZZ	J	Zener Diode	AC
D927	RH-EX0294CEZZ	J	UZ-5.1BSB	AA
D928	RH-DX0053GEZZ	J		AA
D929	RH-DX0053GEZZ	J		AA
D930	RH-EX0301CEZZ	J	UZ-6.2BSC	AA
D951	VHD1A3-F///-1	J	1A3-F	AA
D952	VHD1A3-F///-1	J	1A3-F	AA
D953	RH-EX0293CEZZ	J	UZ-5.1BSA	AA
D954	RH-EX0294CEZZ	J	UZ-5.1BSB	AA
D957	RH-DX0053GEZZ	J		AA
D958	RH-DX0053GEZZ	J		AA
D959	RH-DX0053GEZZ	J		AA
D960	RH-EX0291CEZZ	J	Zener Diode	AA
D2201	RH-EX0168GEZZ	J	HZS15EB2	AA
D2401	RH-DX0053GEZZ	J		AA
D4401	RH-EX0168GEZZ	J	HZS15EB2	AA
D5001	RH-DX0053GEZZ	J		AA
D5002	RH-DX0053GEZZ	J		AA
D5003	RH-DX0053GEZZ	J		AA
D5004	RH-DX0053GEZZ	J		AA
D8851	RH-EX0168GEZZ	J		AA
D8852	RH-DX0053GEZZ	J		AA
⚠IC901	RH-FX0005GEZZ	J		AE
Q851	RH-PX0233GEZZ	J	Photo Diode	AD
Q852	RH-PX0233GEZZ	J	Photo Diode	AD

PACKAGED CIRCUITS

Ref. No.	Part No.	★	Description	Code
X501	RCRSB0166GEZZ	J	Crystal, 4.43MHz	AG
X801	RCRSB0190GEZZ	J	Crystal, 10MHz	AK
X1801	RCRSB0173GEZZ	J	Crystal, 6.9375MHz	AG
X5901	RCRSB0184GEZZ	J	Crystal, 17.73MHz	AM

COILS AND TRANSFORMERS

Ref. No.	Part No.	★	Description	Code
FL2401	RFiLA0020CEZZ	J		AD
FL5001	RFiLC0115GEZZ	J		AC
L201	VP-XF151K0000	J	150μH	AB
L202	VP-XF150K0000	J	15μH	AB
L203	VP-XF330K0000	J	33μH	AB
L204	VP-XF120K0000	J	12μH	AB
L205	VP-XF820K0000	J	82μH	AB
L206	VP-DF1R2M0000	J	1.2μH	AB
L207	VP-XF560K0000	J	56μH	AB
L208	VP-XF151K0000	J	150μH	AB
L209	VP-XF560K0000	J	56μH	AB
L210	VP-XF151K0000	J	150μH	AB
L301	VP-DF101K0000	J	100μH	AB
L302	VP-DF101K0000	J	100μH	AB

COILS AND TRANSFORMERS (Continued)

Ref. No.	Part No.	★	Description	Code
L501	VP-MK561K0000	J	560µH	AB
L504	VP-XF150J0000	J	15µH	AB
L505	VP-XF100K0000	J	10µH	AB
L506	VP-XF390J0000	J	39µH	AB
L509	VP-XF151K0000	J	150µH	AB
L511	VP-XF680K0000	J	68µH	AB
L601	VP-YF822J0000	J	8.2mH	AC
L602	VP-DF221K0000	J	220µH	AB
⚠L902	RCiLF0227GEZZ	J	33mH	AM
L921	RCiLP0171CEZZ	J	10µH	AD
L922	RCiLP0175CEZZ	J	22µH	AD
L1201	VP-DF101K0000	J	100µH	AB
L1801	VP-XF8R2K0000	J	8.2µH	AB
L1802	VP-ZK4R7K0000	J	4.7µH	AB
L4401	VP-MK221K0000	J	220µH	AB
L5901	VP-XF150K0000	J	15µH	AB
L5902	VP-DF101K0000	J	100µH	AB
T601	RTRNH0053GEZZ	J	Osc. Transformer	AE
⚠T901	RTRNZ0043UMZZ	U	Transformer	AR

CONTROL

Ref. No.	Part No.	★	Description	Code
R634	RVR-M4421GEZZ	J	100(B) Bias Current	AB

CAPACITORS

Ref. No.	Part No.	★	Description	Code
C201	VCKYD41HB681K	J	680p 50V Ceramic	AA
C202	VCKYCY1HB391K	J	390p 50V Ceramic	AA
C203	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C204	VCCSD41HL150J	J	15p 50V Ceramic	AA
C205	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C206	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C208	VCCCPA1HH560J	J	56p 50V Ceramic	AA
C209	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C210	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C211	VCCCPA1HH390J	J	39p 50V Ceramic	AA
C212	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C213	VCKYPA1HF473Z	J	0.047 50V Ceramic	AA
C214	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB
C215	VCCCPA1HH101J	J	100p 50V Ceramic	AA
C216	VCCCCY1HH100D	J	10p 50V Ceramic	AA
C217	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C218	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C219	VCKYCY1EB223K	J	0.022 25V Ceramic	AA
C220	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C221	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C222	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C223	VCEAEA1HW335M	J	3.3 50V Electrolytic	AB
C224	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB
C226	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C228	VCEAEA1HW224M	J	0.22 50V Electrolytic	AB
C229	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C230	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C233	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C234	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA

CAPACITORS(Continued)

Ref. No.	Part No.	★	Description	Code
C235	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C236	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C237	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C238	VCCCD41HH4R7K	J	4.7p 50V Ceramic	AA
C239	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C240	VCKYCY1HB391K	J	390p 50V Ceramic	AA
C242	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C243	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C244	VCCCCY1HH221J	J	220p 50V Ceramic	AA
C301	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C302	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C303	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C304	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C307	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C308	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C309	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C310	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C311	VCEAGA0JW476M	J	47 6.3V Electrolytic	AB
C312	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C314	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C315	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C330	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C331	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C332	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C333	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C334	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C335	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C336	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C337	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C338	VCKYCY1HB472K	J	4700p50V Ceramic	AA
C339	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C340	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C341	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C501	VCKYCY1HB332K	J	3300p50V Ceramic	AA
C503	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C504	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C505	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA
C506	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C508	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C509	VCKYCY1EB153K	J	0.015 25V Ceramic	AA
C510	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C511	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C512	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C513	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C514	VCKYCY1HF333Z	J	0.033 50V Ceramic	AA
C515	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C516	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C517	VCCCCY1HH180J	J	18p 50V Ceramic	AA
C519	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C520	VCEAEA1HW474M	J	0.47 50V Electrolytic	AB
C521	VCKYCY1EB223K	J	0.022 25V Ceramic	AA
C523	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C525	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C526	VCCCCY1HH680J	J	68p 50V Ceramic	AA
C527	VCCCCY1HH470J	J	47p 50V Ceramic	AA

CAPACITORS (Continued)

Ref. No.	Part No.	★	Description	Code
C528	VCCCCY1HH560J	J	56p 50V Ceramic	AA
C529	VCEAEA1HW475M	J	4.7 50V Electrolytic	AB
C530	VCCCPA1HH121J	J	120p 50V Ceramic	AA
C531	VCCSD41HL010M	J	1p 50V Ceramic	AA
C532	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C533	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C535	VCCCCY1HH181J	J	180p 50V Ceramic	AA
C536	VCCCCY1HH181J	J	180p 50V Ceramic	AA
C537	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C601	VCKYCY1HB152K	J	1500p50V Ceramic	AA
C602	VCKYD41CX332N	J	3300p16V Ceramic	AA
C603	VCEAAA1HW475T	J	4.7 50V Electrolytic	AB
C604	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C605	VCQYTA1HM123J	J	0.012 50V Mylar	AA
C606	VCKYCY1HB682K	J	6800p50V Ceramic	AA
C607	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C608	RC-KZ0029GEZZ	J	0.1 25V Ceramic	AA
C609	RC-KZ0029GEZZ	J	0.1 25V Ceramic	AA
C610	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C611	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C612	VCKYCY1EB223K	J	0.022 25V Ceramic	AA
C613	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C614	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C615	VCCCCY1HH151J	J	150p 50V Ceramic	AA
C616	VCKYCY1HB331K	J	330p 50V Ceramic	AA
C617	VCCCCY1HH220J	J	22p 50V Ceramic	AA
C618	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C619	VCKYCY1HB821K	J	820p 50V Ceramic	AA
C621	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C622	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C623	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C624	VCQPSA2AA562J	J	5600p100V Mylar	AC
C625	VCRYPA1HA221J	J	220p 50V Ceramic	AB
C626	RC-KZ0029GEZZ	J	0.1 25V Ceramic	AA
C701	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C703	VCE9EA1HW105M	J	1 50V Elect.(N.P.)	AC
C704	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C705	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C706	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB
C707	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C708	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C709	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C710	VCEAEA1CW106M	J	10 16V Electrolytic	AB
C711	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C712	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB
C713	VCEAEA1HW225M	J	2.2 50V Electrolytic	AB
C714	VCEAEA1CW226M	J	22 16V Electrolytic	AB
C715	VCKYD41HB102K	J	1000p50V Ceramic	AA
C716	RC-EZ0123GEZZ	J	47 10V Electrolytic	AB
C717	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C718	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C719	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C720	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C721	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C722	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA

CAPACITORS (Continued)

Ref. No.	Part No.	★	Description	Code
C723	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C724	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C725	VCKYCY1HB472K	J	4700p50V Ceramic	AA
C726	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C727	VCEAEA0JW107M	J	100 6.3V Electrolytic	AB
C728	VCKYCY1HB472K	J	4700p50V Ceramic	AA
C729	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C730	VCEAEA0JW336M	J	33 6.3V Electrolytic	AB
C731	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C732	VCFYSA1HB334J	J	0.33 50V M.Polyester	AB
C733	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C734	VCKYCY1HF473Z	J	0.047 50V Ceramic	AA
C736	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C737	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C738	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C740	VCKYCY1HB472K	J	4700p50V Ceramic	AA
C801	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C802	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C803	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C805	VCEAEA1HW105M	J	1 50V Electrolytic	AB
C807	VCCCCY1HH220J	J	22p 50V Ceramic	AA
C808	VCCCCY1HH220J	J	22p 50V Ceramic	AA
C811	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C812	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C813	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C814	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C815	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C816	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C817	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C819	VCEAEA0JW108M	J	1000 6.3V Electrolytic	AC
C820	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C821	VCCCCY1HH101J	J	100p 50V Ceramic	AA
C822	VCKYCY1CF334Z	J	0.33 16V Ceramic	AA
C823	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C824	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C825	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C826	VCE9GA1HW105M	J	1 50V Elect.(N.P.)	AB
C829	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C830	VCKYD41HB102K	J	1000p50V Ceramic	AA
C831	VCKYCY1HB102K	J	1000p50V Ceramic	AA
C832	VCKYD41HB102K	J	1000p50V Ceramic	AA
C833	VCKYCY1HB102K	J	1000p50V Ceramic	AA
⚠C901	RC-FZ016SGEZZ	J	0.47 250V M.Polyester	AK
⚠C902	RC-FZ008SGEZZ	J	0.1 250V M.Polyester	AD
⚠C905	RC-KZ0070CEZZ	J	2200p400V Ceramic	AD
⚠C906	RC-KZ0070CEZZ	J	2200p400V Ceramic	AD
⚠C907	RC-KZ0070CEZZ	J	2200p400V Ceramic	AD
⚠C908	RC-KZ0070CEZZ	J	2200p400V Ceramic	AD
⚠C909	RC-EZ0440GEZZ	J	47 400V Electrolytic	AH
⚠C910	VCEAGA2AW225M	J	2.2 100V Electrolytic	AB
⚠C911	VCFYAA2GA333K	J	0.033 400V M.Polyester	AD
⚠C912	RC-KZ0112CEZZ	J	100p 1kV Ceramic	AB
⚠C913	VCQYTA1HM473J	J	0.047 50V Mylar	AA
⚠C914	VCQYTA1HM473J	J	0.047 50V Mylar	AA
⚠C915	VCQYTA1HM472J	J	4700p50V Mylar	AB

CAPACITORS (Continued)

Ref. No.	Part No.	★	Description	Code
C921	VCEAGA1AW477M	J	470 10V Electrolytic	AC
C922	VCEAGA1HW476M	J	47 50V Electrolytic	AB
C923	VCEAVA1CN228M	J	2200 16V Electrolytic	AH
⚠C924	RC-QZ0104GEZZ	J	2200p250V Mylar	AC
C925	VCEAVA1AN228M	J	2200 10V Electrolytic	AE
⚠C926	RC-QZ0104GEZZ	J	2200p250V Mylar	AC
C927	VCQYTA1HM103J	J	0.01 50V Mylar	AA
C928	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C929	VCEAGA1AW477M	J	470 10V Electrolytic	AC
C930	VCEAGA1HW476M	J	47 50V Electrolytic	AB
C931	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C932	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C935	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C951	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C952	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C953	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C954	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C955	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C957	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C958	VCEAGA1CW226M	J	22 16V Electrolytic	AB
C959	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C960	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C961	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C962	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C963	VCKYCY1HF333Z	J	0.033 50V Ceramic	AA
C965	VCKYPA1HF223Z	J	0.022 50V Ceramic	AA
C966	VCEAGA1HW106M	J	10 50V Electrolytic	AC
C1201	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1202	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C1203	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C1204	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1205	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C1206	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C1207	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C1208	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1209	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C1210	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C1211	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C1212	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1557	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1558	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C1559	VCEA2A1CW227M	J	220 16V Electrolytic	AB
C1560	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1562	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C1563	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C1564	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C1565	VCEAGA1CW106M	J	10 16V Electrolytic	AA
C1569	VCKYD41HF104Z	J	0.1 50V Ceramic	AA
C1801	VCEAGA1HW224M	J	0.22 50V Electrolytic	AA
C1802	VCEAGA1HW104M	J	0.1 50V Electrolytic	AA
C1803	VCEAGA1HW224M	J	0.22 50V Electrolytic	AA
C1805	VCEAGA0JW476M	J	47 6.3V Electrolytic	AB
C1806	VCCCPA1HH270J	J	27p 50V Ceramic	AA
C1807	VCCCCY1HH220J	J	22p 50V Ceramic	AA
C2201	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB

CAPACITORS (Continued)

Ref. No.	Part No.	★	Description	Code
C2202	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C2251	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C2252	VCEAGA0JW476M	J	47 6.3V Electrolytic	AB
C2253	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C2254	VCEAGA1HW335M	J	3.3 50V Electrolytic	AB
C2401	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C2402	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C2403	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C2404	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C2405	VCKYD41HB102K	J	1000p 50V Ceramic	AA
C2406	VCKYCY1HF223Z	J	0.022 50V Ceramic	AB
C2407	VCQYTA1HM563J	J	0.056 50V Mylar	AB
C2408	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C4401	VCEAGA1CW107M	J	100 16V Electrolytic	AB
C4402	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C4403	VCEA2A0JW477M	J	470 6.3V Electrolytic	AB
C4404	VCEAGA1CW476M	J	47 16V Electrolytic	AB
C5001	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C5002	VCEAGA0JW476M	J	47 6.3V Electrolytic	AB
C5003	VCKYPA1HF103Z	J	0.01 50V Ceramic	AA
C5004	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C5010	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA
C5011	VCCCCY1HH470J	J	47p 50V Ceramic	AA
C5903	VCKYCY1EF104Z	J	0.1 25V Ceramic	AA
C5904	VCEAGA1HW105M	J	1 50V Electrolytic	AC
C5905	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C5906	VCCCCY1HH330J	J	33p 50V Ceramic	AA
C5907	VCKYD41CY103N	J	0.01 16V Ceramic	AA
C5908	VCEAEA0JW476M	J	47 6.3V Electrolytic	AB
C5909	VCCCCY1HH8R0D	J	8p 50V Ceramic	AA
C5910	VCCCCY1HH120J	J	12p 50V Ceramic	AA
C8851	VCKYCY1HF103Z	J	0.01 50V Ceramic	AA

RESISTORS

Ref. No.	Part No.	★	Description	Code
R201	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R202	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R203	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R204	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R205	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R206	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R207	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R208	VRD-RA2BE561J	J	560 1/8W Carbon	AA
R209	VRS-CY1JF182J	J	1.8k 1/16W Metal Oxide	AA
R210	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R211	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R212	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R213	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R214	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R215	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R217	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R219	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R220	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R226	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R228	VRD-RA2BE102J	J	1k 1/8W Carbon	AA

RESISTORS (Continued)

Ref. No.	Part No.	★	Description	Code
R229	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R230	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R301	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R302	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R303	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R304	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R305	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R306	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R307	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA
R311	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R312	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R313	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R314	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R315	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R316	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R330	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R331	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R332	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R333	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R334	VRS-CY1JF561J	J	560 1/16W Metal Oxide	AA
R335	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R336	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R337	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R338	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R339	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R340	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R341	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R501	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R502	VRS-CY1JF821J	J	820 1/16W Metal Oxide	AA
R506	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R507	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R508	VRS-CY1JF122J	J	1.2k 1/16W Metal Oxide	AA
R510	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R513	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R515	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R517	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R523	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R524	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R540	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R601	VRS-CY1JF100J	J	10 1/16W Metal Oxide	AA
R602	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R603	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R604	VRS-CY1JF274J	J	270k 1/16W Metal Oxide	AA
R605	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R606	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R607	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R608	VRS-CY1JF822J	J	8.2k 1/16W Metal Oxide	AA
R609	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R610	VRS-CY1JF225J	J	2.2M 1/16W Metal Oxide	AA
R611	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R612	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R613	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R614	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R615	VRS-CY1JF823J	J	82k 1/16W Metal Oxide	AA
R616	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA

RESISTORS (Continued)

Ref. No.	Part No.	★	Description	Code
R617	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R618	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R619	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R620	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R621	VRD-RA2BE683J	J	68k 1/8W Carbon	AA
R622	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R623	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R624	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R625	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R626	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R629	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R630	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R631	VRS-CY1JF470J	J	47 1/16W Metal Oxide	AA
R632	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R633	VRG-SC2EB4R7J	J	4.7 1/4W Fuse Resistor	AB
R634	*See Control*			
R635	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R636	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R637	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R638	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R639	VRD-RA2BE153J	J	15k 1/8W Carbon	AA
R701	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R703	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R704	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R705	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
R706	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R707	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R708	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R709	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R710	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R711	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R713	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R714	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R715	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R716	VRD-RA2BE393J	J	39k 1/8W Carbon	AA
R717	VRD-RA2BE183J	J	18k 1/8W Carbon	AA
R718	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R719	VRS-CY1JF823J	J	82k 1/16W Metal Oxide	AA
R720	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R723	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R724	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R725	VRS-CY1JF563J	J	56k 1/16W Metal Oxide	AA
R726	VRS-CY1JF474J	J	470k 1/16W Metal Oxide	AA
R727	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R728	VRS-CY1JF224J	J	220k 1/16W Metal Oxide	AA
R729	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R730	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R731	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R732	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R733	VRD-RA2BE155J	J	1.5M 1/8W Carbon	AA
R734	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R735	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R736	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R737	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R738	VRD-RA2BE223J	J	22k 1/8W Carbon	AA

RESISTORS (Continued)

Ref. No.	Part No.	★	Description	Code
R739	VRS-CY1JF153J	J	15k 1/16W Metal Oxide	AA
R741	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R742	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R743	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R744	VRD-RA2HD1R0J	J	1 1/2W Carbon	AA
R745	VRD-RA2HD1R0J	J	1 1/2W Carbon	AA
R746	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R747	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R748	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R752	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R801	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R802	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R803	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R804	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R805	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R806	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R807	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R809	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R810	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R812	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R813	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R814	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R815	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R818	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R821	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R822	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R823	VRD-RA2BE471J	J	470 1/8W Carbon	AA
R824	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R825	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R834	VRD-RA2BE473J	J	47k 1/8W Carbon	AA
R851	VRD-RA2EE151J	J	150 1/4W Carbon	AA
R854	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R855	VRD-RA2BE123J	J	12k 1/8W Carbon	AA
R856	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R857	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R858	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R859	VRD-RA2BE271J	J	270 1/8W Carbon	AA
R860	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R861	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R862	VRD-RA2BE154J	J	150k 1/8W Carbon	AA
R863	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R864	VRS-CY1JF154J	J	150k 1/16W Metal Oxide	AA
⚠R901	VRD-RA2HD105J	J	1M 1/2W Carbon	AA
⚠R902	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
⚠R903	VRC-UA2HG685K	J	6.8M 1/2W Solid	AA
⚠R904	RR-WZ0003GEZZ	J	4.7 2W Cement	AD
⚠R905	VRD-RA2HD224J	J	220k 1/2W Carbon	AA
⚠R906	VRD-RA2HD224J	J	220k 1/2W Carbon	AA
⚠R907	VRD-RA2EE563J	J	56k 1/4W Carbon	AA
⚠R908	RR-SZ0007GEZZ	J	68k 2W Cement	AB
⚠R909	VRD-RA2HD470J	J	47 1/2W Carbon	AA
⚠R910	VRD-RA2HD470J	J	47 1/2W Carbon	AA
⚠R911	VRD-RA2EE471J	J	470 1/4W Carbon	AA
R921	VRG-SC2EB1R0J	J	1 1/4W Fuse Resistor	AB
R922	VRD-RA2HD100J	J	10 1/2W Carbon	AA

RESISTORS (Continued)

Ref. No.	Part No.	★	Description	Code
R924	VRG-SC2EB100J	J	10 1/4W Fuse Resistor	AB
R925	VRD-RA2BE221J	J	220 1/8W Carbon	AA
R926	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R927	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R928	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R929	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R930	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R931	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R932	VRS-CY1JF221J	J	220 1/16W Metal Oxide	AA
R933	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R951	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R952	VRD-RA2BER56J	J	0.56 1/8W Carbon	AA
R953	VRD-RA2HD472J	J	4.7k 1/2W Carbon	AA
R954	VRD-RA2BE270J	J	27 1/8W Carbon	AA
R955	VRD-RA2BE683J	J	68k 1/8W Carbon	AA
R956	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R960	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R961	VRD-RA2BE822J	J	8.2k 1/8W Carbon	AA
R962	VRS-CY1JF683J	J	68k 1/16W Metal Oxide	AA
R963	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R964	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R965	VRS-CY1JF123J	J	12k 1/16W Metal Oxide	AA
R966	VRD-RA2BE681J	J	680 1/8W Carbon	AA
R967	VRD-RA2BE333J	J	33k 1/8W Carbon	AA
R969	VRD-RA2HD821J	J	820 1/2W Carbon	AA
R971	VRD-RA2HD821J	J	820 1/2W Carbon	AA
R990	VRS-CY1JF123J	J	12k 1/16W Metal Oxide (VC-A72HM)	AA
R991	VRD-RA2BE472J	J	4.7k 1/8W Carbon (VC-A72HM)	AA
R1201	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R1202	VRD-RA2BE331J	J	330 1/8W Carbon	AA
R1203	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R1207	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R1208	VRS-CY1JF222J	J	2.2k 1/16W Metal Oxide	AA
R1209	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R1210	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R1211	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R1222	VRS-CY1JF272J	J	2.7k 1/16W Metal Oxide	AA
R1223	VRD-RA2BE103J	J	10k 1/8W Carbon	AA
R1555	VRS-CY1JF334J	J	330k 1/16W Metal Oxide	AA
R1556	VRS-CY1JF474J	J	470k 1/16W Metal Oxide	AA
R1557	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R1801	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R1802	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R1803	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R1804	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R1805	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R1806	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA
R2201	VRS-CY1JF750J	J	75 1/16W Metal Oxide	AA
R2202	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R2203	VRD-RA2BE391J	J	390 1/8W Carbon	AA
R2401	VRS-CY1JF392J	J	3.9k 1/16W Metal Oxide	AA
R2402	VRS-CY1JF681J	J	680 1/16W Metal Oxide	AA
R2403	VRD-RA2BE154J	J	150k 1/8W Carbon	AA

RESISTORS (Continued)

Ref. No.	Part No.	★	Description	Code
R2404	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R2405	VRD-RA2BE102J	J	1k 1/8W Carbon	AA
R2410	VRD-RA2BE684J	J	680k 1/8W Carbon	AA
R4401	VRD-RA2BE181J	J	180 1/8W Carbon	AA
R4402	VRD-RA2BE151J	J	150 1/8W Carbon	AA
R4403	VRD-RA2BE750J	J	75 1/8W Carbon	AA
R4404	VRS-CY1JF152J	J	1.5k 1/16W Metal Oxide	AA
R4405	VRS-CY1JF101J	J	100 1/16W Metal Oxide	AA
R4406	VRS-CY1JF102J	J	1k 1/16W Metal Oxide	AA
R5001	VRS-CY1JF471J	J	470 1/16W Metal Oxide	AA
R5002	VRD-RA2EE1R0J	J	1 1/4W Carbon	AA
R5003	VRD-RA2BE104J	J	100k 1/8W Carbon	AA
R5004	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5005	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5006	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5007	VRS-CY1JF104J	J	100k 1/16W Metal Oxide	AA
R5903	VRD-RA2BE121J	J	120 1/8W Carbon	AA
R6601	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R6602	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R6609	VRD-RA2BE272J	J	2.7k 1/8W Carbon	AA
R6610	VRS-CY1JF682J	J	6.8k 1/16W Metal Oxide	AA
R6613	VRS-CY1JF331J	J	330 1/16W Metal Oxide	AA
R6614	VRS-CY1JF332J	J	3.3k 1/16W Metal Oxide	AA
R6651	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R6652	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R6653	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R6654	VRS-CY1JF333J	J	33k 1/16W Metal Oxide	AA
R6655	VRS-CY1JF183J	J	18k 1/16W Metal Oxide	AA
R6656	VRS-CY1JF273J	J	27k 1/16W Metal Oxide	AA
R6657	VRS-CY1JF473J	J	47k 1/16W Metal Oxide	AA
R6658	VRS-CY1JF562J	J	5.6k 1/16W Metal Oxide	AA
R6659	VRS-CY1JF103J	J	10k 1/16W Metal Oxide	AA
R8851	VRS-CY1JF472J	J	4.7k 1/16W Metal Oxide	AA
R8852	VRS-CY1JF223J	J	22k 1/16W Metal Oxide	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
⚠ACC901	QACCB5007UMZZ	U	AC Cord (VC-A72HM)	AR
⚠ACC901	QACCB9001AJZZ	V	AC Cord (VC-A72LM)	AL
DG5001	VVK10BT143G-1	J	Fluorescent Display Tube	AV
⚠F901	QFS-C2026CEZZ	J	Fuse T2AH/250V	AE
FB801	RBLN-0013GEZZ	J	Ferrite Bead	AB
⚠FH901	QFSHD1009CEZZ	J	Fuse Holder	AA
⚠FH902	QFSHD1010CEZZ	J	Fuse Holder	AA
P601	QPLGN0247REZZ	J	Plug, 2pin (AE)	AA
P701	QPLGZ0657REZZ	J	Plug, 6pin (AO)	AC
P702	QPLGN0247REZZ	J	Plug, 2pin (AL)	AA
P704	QPLGZ1074GEZZ	J	Plug, 10pin (AC)	AC
P705	QPLGZ0360GEZ	J	Plug, 3pin (AR)	AB
⚠P901	QPLGN0269GEZZ	J	Plug, 2pin (PA)	AB
P2251	QPLGZ0331GEZZ	J	Plug, 3pin	AB
SC301	QSOCN0794REZZ	J	Socket, 7pin (AH)	AE
SC601	QSOCN0884REZZ	J	Socket, 8pin (AA)	AC
SC701	QSOCN0684REZZ	J	Socket, 6pin (AD)	AB
SC2201	QSOCZ1280GEZZ	J	Socket, A/V	AH

MISCELLANEOUS PARTS (Continued)

Ref. No.	Part No.	★	Description	Code
S851	QSW-K0042AJZZ	V	Switch, REC	AG
S5001	QSW-K0002AJZZ	V	Switch, Power	AD
S5002	QSW-K0002AJZZ	V	Switch, TV/VCR	AD
S5004	QSW-K0002AJZZ	V	Switch, Set-up	AD

—— End of Main ——

DUNTK4929TEV0
OPERATION UNIT

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
SC8801	QSOCZ0657GEZZ	J	Socket 6pin (OA)	AD
S8801	QSW-K0079GEZZ	J	Switch, Stop/Eject	AB
S8802	QSW-K0079GEZZ	J	Switch, Play	AB
S8803	QSW-K0079GEZZ	J	Switch, REC	AB
S8804	QSW-K0079GEZZ	J	Switch, Pause/Still	AB
S8805	QSW-K0079GEZZ	J	Switch, CH (+)	AB
S8806	QSW-K0079GEZZ	J	Switch, CH (−)	AB
S8809	QSW-Z0069GEZZ	J	Switch, Shuttle	AM

—— End of Operation ——

DUNTK4930TEV1
R/C RECEIVER UNIT

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
SC5501	QSOCZ0360GEZZ	J	Socket 3pin (RA)	AC
RMC5501	RRMCU0209CEZZ	J	Remote Control Receiver	AH

—— End of R/C Receiver ——

DUNTK4931TEV0
FRONT A/V UNIT

COIL

Ref. No.	Part No.	★	Description	Code
L2301	VP-XF3R3K0000	J	Coil, 3.3µH	AB

CAPACITOR

Ref. No.	Part No.	★	Description	Code
C2301	VCCCD41HH100J	J	10p 50V Ceramic	AB

RESISTORS

Ref. No.	Part No.	★	Description	Code
R2301	VRD-RA2BE101J	J	100 1/8W Carbon	AA
R2302	VRD-RA2BE750J	J	75 1/8W Carbon	AA

MISCELLANEOUS PARTS

Ref. No.	Part No.	★	Description	Code
J2301	QJAKF0036GEZZ	J	Jack, A/V	AB
SC2301	QSOCZ0331GEZZ	J	Socket, 3pin	AC

—— End of Front A/V ——

MECHANISM CHASSIS PARTS

Ref. No.	Part No.	★	Description	Code
			Main Chassis Ass'y	
2	NROLP0084AJZZ	V	Supply Impedance Roller	AB
3	PGiDH0031AJFW	V	Supply Impedance Roller Frange	AD
4	PGiDS0027AJZZ	V	Supply Impedance Roller Lower Frange	AA
5	NSFTL0563AJFW	V	Supply Impedance Roller Inner	AE
6	LPOLM0050GEZZ	J	Supply Pole Base Ass'y	AM
7	LPOLM0051GEZZ	J	Take-Up Pole Base Ass'y	AM
8	NROLP0110GEZZ	J	Guide Roller	AH
9	MLEVF0414AJZZ	V	Reverse Guide Lever Ass'y	AG
10	MSPRD0147AJFJ	V	Reverse Guide Spring	AB
11	PSPAZ0391AJZZ	V	Reverse Guide Spacer	AE
12	RHEDU0083GEZZ	J	Audio/Control Head	AR
13	MLEVF0415AJFW	V	Audio/Control Head Arm	AC
14	MSPRD0148AJFJ	V	Audio/Control Head Arm Spring	AB
15	MSPRC0189AJFJ	V	Azimuth Spring	AB
16	RHEDT0032GEZZ	J	Full Erase Head	AK
17	PSPAZ0392AJZZ	V	Audio/Control Head Arm Spacer	AB
18	QPWBF4735AJZZ	V	Audio/Control Head PWB	AC
19	QSOCN0885REZZ	J	Socket, 8 pin	AB
20	NBLTK0065AJ00	V	Reel Belt	AE
21	MLEVF0416GEZZ	J	Pinch Roller Lever Ass'y	AU
22	MLEVP0237AJZZ	V	Pinch Double Action Lever	AD
23	MLEVF0417AJZZ	V	Pinch Drive Lever Ass'y	AG
24	NGERH1216AJZZ	V	Pinch Drive Cam	AE
25	MLEVP0238AJZZ	V	Open Lever	AC
26	MSPRT0377AJFJ	V	Pinch Double Action Spring	AC
27	MSPRD0149AJFJ	V	Earth Spring	AB
28	MLEVF0418AJZZ	V	Tension Arm Ass'y	AG
29	LBOSZ1001AJZZ	V	Tension Arm Boss	AB
30	MSPRT0378AJFJ	V	Tension Spring	AC
31	LBNDK1008AJZZ	V	Tension Band Ass'y	AG
32	NSFTP0032AJZZ	V	Tension Pole Adjust Cam	AB
33	NGERH1217AJ00	V	Master Cam	AE
34	NPLYV0146AJZZ	V	Motor Pulley	AB
35	NGERW1051AJZZ	V	Worm Gear	AC
36	NGERW1052AJZZ	V	Worm Wheel Gear	AC
37	NGERH1218AJZZ	V	Connect Gear	AC
38	LANGK0161AJZZ	V	Loading Motor Angle Ass'y	AD
39	NBRGP0017AJZZ	V	Bearing	AB
40	MSLiP0006AJZZ	V	Sifter	AH
41	MLEVF0419AJZZ	V	Sifter Drive Lever Ass'y	AG
42	NGERH1219AJZZ	V	Take-Up Loading Gear	AD
43	MLEVF0420AJZZ	V	Take-Up Loading Arm Ass'y	AG
44	NGERH1220AJZZ	V	Supply Loading Gear	AC

Ref. No.	Part No.	★	Description	Code
45	MLEVF0422AJZZ	V	Supply Loading Arm Ass'y	AG
46	CLEVP0239AJ00	V	Auto Head Cleaner Ass'y	AF
47	MSPRT0379AJFJ	V	Loading Double Action Spring	AB
48	NDAiV1065AJ00	V	Reel Disk	AB
49	MARMP0053AJZZ	V	Reel Idler	AM
50	MLEVP0240AJZZ	V	Clutch Lever	AB
51	NGERH1221AJZZ	V	Clutch Gear Ass'y	AK
52	NPLYV0147AJZZ	V	Reel Pulley Ass'y	AP
53	NGERH1224AJZZ	V	Playback Gear	AD
54	MLEVP0241AJZZ	V	Clutch Connect Arm	AB
55	MLEVP0242AJZZ	V	Take-Up Main Brake Ass'y	AK
56	MLEVP0249AJZZ	V	Take-Up Lock Lever	AC
57	MLEVP0244AJZZ	V	Supply Main Brake Lever Ass'y	AH
58	MSPRT0380AJFJ	V	Main Brake Spring	AB
59	NGERH1225AJZZ	V	Cassette Hausing Control Drive Gear	AD
60	PREFL1004AJZZ	V	Light Guide	AD
61	MLEVP0250AJZZ	V	Slow Brake Ass'y	AD
62	MSPRT0383AJFJ	V	Slow Brake Spring	AC
63	RMOTN2051GEZZ	J	Capstan Motor	BD
64	RMOTM1062GEZZ	J	Loading Motor	AP
65	QCNW-0156AJZZ	V	Lead Wire for Loading Motor	AE
66	QCNW-0155AJZZ	V	FFC for Audio/Control	AF
67	QCNW-0157AJZZ	V	FFC for Drum Motor	AF
68	PSPAZ0434GEFW	J	Preload Collar	AL
69	LX-XZ3032GEFP	J	Preload Collar Mounting Set Screw (M4 + 5WP)	AC
70	PGiDC0052GEFW	J	Drum Base	AK
71	XBPSD30P08J00	J	Drum Base Mounting Screw (SW3P + 8S)	AA
72	QBRSK0034GEZZ	J	Drum Earth Brush	AD
73	MSPRC0194GEFJ	J	Drum Earth Brush Spring	AA
74	RMOTP1116GEZZ	J	Drum Drive Motor	BF
75	XBPSD26P06J00	J	Drum Drive Motor Mounting Screw (SW2.6P + 6S)	AA
76	DDRMW0015TEV0	U	Drum Ass'y	BS

—— End of Mechanism Chassis Parts ——

CASSETTE HOUSING CONTROL PARTS

Ref. No.	Part No.	★	Description	Code
300	CHLDX3070TEV1	U	Cassette Housing Control Ass'y	AX
301	LHLDX1024AJ00	V	Frame (L)	AG
302	LHLDX1025AJ00	V	Frame (R)	AG
303	NGERR3003AJFW	V	Drive Angle	AE
304	NGERR1005AJZZ	V	Double Action Rack	AC
305	MSPRT0381AJFJ	V	Double Action Spring	AC
306	MSLiF0070AJFW	V	Slider	AH
307	LHLDX1026AJ00	V	Holder (L)	AD
308	MLEVP0246AJ00	V	Proof Lever (L)	AB
309	MSPRD0150AJFJ	V	Proof Lever (L) Spring	AB
310	LHLDX1027AJ00	V	Holder (R)	AD
311	MSPRP0159AJFJ	V	Cassette Spring	AD
312	MLEVF0424AJFW	V	Proof Lever (R)	AC
313	MSPRD0151AJFJ	V	Proof Lever (R) Spring	AB
314	NGERH1226AJ00	V	Drive Gear (L)	AD
315	MSPRD0152AJFJ	V	Drive Gear (L) Spring	AC
316	NGERH1227AJ00	V	Drive Gear (R)	AD
317	MSPRD0153AJFJ	V	Drive Gear (R) Spring	AC
318	NGERH1228AJ00	V	Synchro Gear	AC
319	NSFTD0036AJFD	V	Main Shaft	AG
320	LANGF9570AJFW	V	Upper Plate	AH
321	MLEVP0247AJ00	V	Door Open Lever	AC
322	MLEVP0248AJ00	V	Sensor Lever	AB
323	MSPRT0382AJFJ	V	Sensor Lever Spring	AB
324	XHPSD30P06WS0	J	C3P + 6S (for Cassette Housing Control)	AA
325	PSPAH0008AJ00	V	Spacer	AB

—— End of Cassette Housing Control Parts ——

SCREWS, NUTS AND WASHERS

Ref. No.	Part No.	★	Description	Code
200	LX-XZ3030GEFD	J	Set Screw	AC
201	LX-BZ3095GEFD	J	Audio/Control Head Screw	AA
202	LX-BZ3096GEFD	J	Tilt Adjusting Screw	AA
203	XBPSD26P06000	J	Azimuth Adjusting Screw (2.6P + 6S)	AA
204	XHPSD26P08WS0	J	Screw, C2.6P + 8S (For FE Head)	AA
206	XBPSD30P04J00	J	Screw, SW3P + 4S (For Loading Motor)	AA
207	XHPSD26P06000	J	Screw, 2.6P + 6S (For Capstan Motor)	AA
208	XHPSD26P06WS0	J	Screw, C2.6P + 6S (For Loading Motor Angle Ass'y)	AA
209	XHPSD30P08WS0	J	Screw, C3P + 8S (For Drum Base)	AA
210	LX-NZ3046GEFW	J	X-Position Adjusting Nut	AB
211	LX-NZ3019GEZZ	J	Reverse Guide Adjusting Nut	AB
212	XNFSD40-31000	J	Audio/Control Head Adjusting Nut (M4)	AB
213	XNFSD20-16000	J	S.I. Roller Adjusting Nut (M2)	AA
214	XWHJZ52-05110	J	Washer, W5.2P-11-0.5 (Reel Height Adj.)	AB
215	XWHJZ52-03110	V	Washer, W5.2P-11-0.3 (Reel Height Adj.)	AB
216	XWHJZ52-04110	V	Washer, W5.2P-11-0.4 (Reel Height Adj.)	AB
217	XWHJZ52-06110	V	Washer, W5.2P-11-0.6	AB
218	XWHJZ52-07110	V	Washer, W5.2P-11-0.7	AB
219	XWHJZ31-02070	J	Washer, W3.1P-7-0.25	AA
220	LX-WZ1073GE00	J	Cut Washer, CW4.5P-11-0.5	AB
221	LX-WZ1006GE00	J	Cut Washer, CW2.6P-5.4-0.5	AA
222	LX-WZ1041GE00	J	Cut Washer, CW2.6P-6-0.5	AA
223	XRESJ40-06000	J	E-Ring, E-4	AA
224	LX-WZ1077AJ00	V	Bearing Fixed Washer t0.4 (Worm Gear THRUST PLAY Adj.)	AB
225	LX-WZ1078AJ00	V	Bearing Fixed Washer t0.5 (Worm Gear THRUST PLAY Adj.)	AB
226	LX-WZ1079AJ00	V	Bearing Fixed Washer t0.6 (Worm Gear THRUST PLAY Adj.)	AB

SCREWS, NUTS AND WASHERS (Continued)

Ref. No.	Part No.	★	Description	Code
227	LX-WZ1080AJ00	V	Bearing Fixed Washer t0.7 (Worm Gear THRUST PLAY Adj.)	AB
228	LX-WZ1081AJ00	V	Bearing Fixed Washer t0.8 (Worm Gear THRUST PLAY Adj.)	AB

—— End of Screws, Nuts and Washers ——

MECHANICAL PARTS

Ref. No.	Part No.	★	Description	Code
601	GCABA3090UMSP	U	Top Cabinet	AU
602	CCABB1143TEV0	U	Frame Ass'y	AV
602-1	GCABB1143UMZZ	U	Main Frame	AR
602-2	PFLT-0016AJZZ	V	Foot Felt	AB
603	GCOVA1841UMZZ	U	Antenna Terminal Cover	AE
604	LX-HZ3079GEFD	J	Screw	AB
605	XEBSD30P12000	J	Screw	AA
606	XEBSD40P12000	J	Screw	AA
607	XHPSD30P06WS0	J	Screw	AA
608	XESSF30P12000	J	Screw	AA
609	PSPAZ0390AJZZ	V	Spacer	AC
610	PSLDM4449UMFW	U	Head Amp. Shield (Top)	AB
611	PSLDM4450UMFW	U	Head Amp. Shield (Bottom)	AB
612	LANGQ9054UMFW	U	Trans Earth Angle	AC
613	PSPAZ0456UMZZ	U	Spacer	AA
614	LHLDZ1909UMZZ	U	Tuner Holder	AB
615	LANGQ9055UMFW	U	Conv. Earth Angle	AC
616	LX-HZ3030GEFF	J	Screw	AA
617	PSLDM4469UMFW	U	FFC Shield	AD
618	LHLDP1143UMZZ	U	LED Holder	AD
619	TLABM0135UMZZ	U	Model Label (VC-A72HM)	AD
619	TLABM0136UMZZ	U	Model Label (VC-A72LM)	AD
620	PSPAZ0453AJZZ	V	Spacer	AC
621	LHLDZ1746UMZZ	U	Converter Holder	AE
622	GBDYU3089UMZZ	U	Bottom Plate	AG

—— End of Mechanical Parts ——

FRONT PANEL PARTS

Ref. No.	Part No.	★	Description	Code
501	CPNLC1865TEV0	U	Front Panel Ass'y	BA
501-2	JBTN-2575AJSA	V	Operate Button	AE
501-3	CBTN-2594TEV1	U	Button Ass'y	AH
501-3-1	LHLDZ1891UMZZ	U	Button Holder	AC
501-3-2	JBTN-2594UMSB	U	Stop/Pause Button	AE
501-4	JBTN-2579AJSA	V	CH Set Button	AF
501-5	HDECQ1208UMSA	U	Front Decoration Window	AN
501-6	HDECQ1200UMSA	U	Cassette Flap	AG
501-7	HBDGB1008AJSA	V	Badge, "SHARP"	AE
501-8	MSPRD0103AJFJ	V	Cassette Spring	AB
501-9	JBTN-2576UMSA	U	CH/REC Button	AC
501-10	JKNBK1077AJSA	V	Dial	AE
501-11	JBTN-2595UMSB	U	Play Button	AC

—— End of Front Panel Parts ——

SUPPLIED ACCESSORIES

ACCESSORIES

Ref. No.	Part No.	★	Description	Code
	QCNW-7544UMZZ	U	75 ohm Coaxial Cable	AL
	RRMCG0013AJSA	U	Infrared Remote Control Unit	BG
	93GNT045721	U	Battery Cover, Infrared R/C Unit	AC

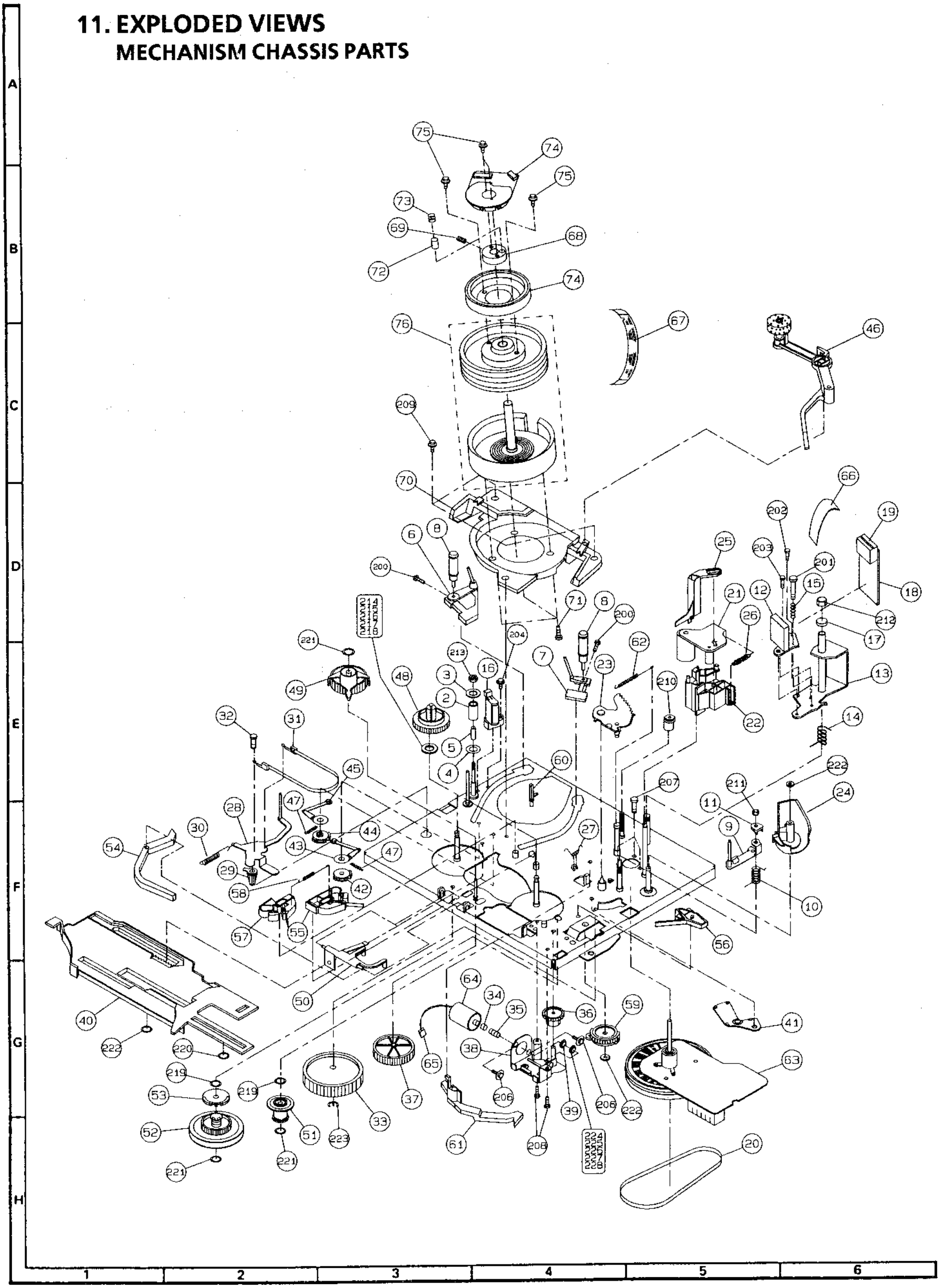
ACCESSORIES (NOT REPLACEMENT ITEM)

Ref. No.	Part No.	★	Description	Code
	TGAN-3135UMZZ	-	Resistration Card (VC-A72HM)	—
	TiNS-2372UMZZ	-	Operation Manual (VC-A72HM)	—
	TiNS-2438UMZZ	-	Operation Manual (VC-A72LM)	—
	TiNS-2411UMZZ	-	Quick Set-up Guide Card (VC-A72HM)	—

—— End of Supplied Accessories ——

11. EXPLODED VIEWS

MECHANISM CHASSIS PARTS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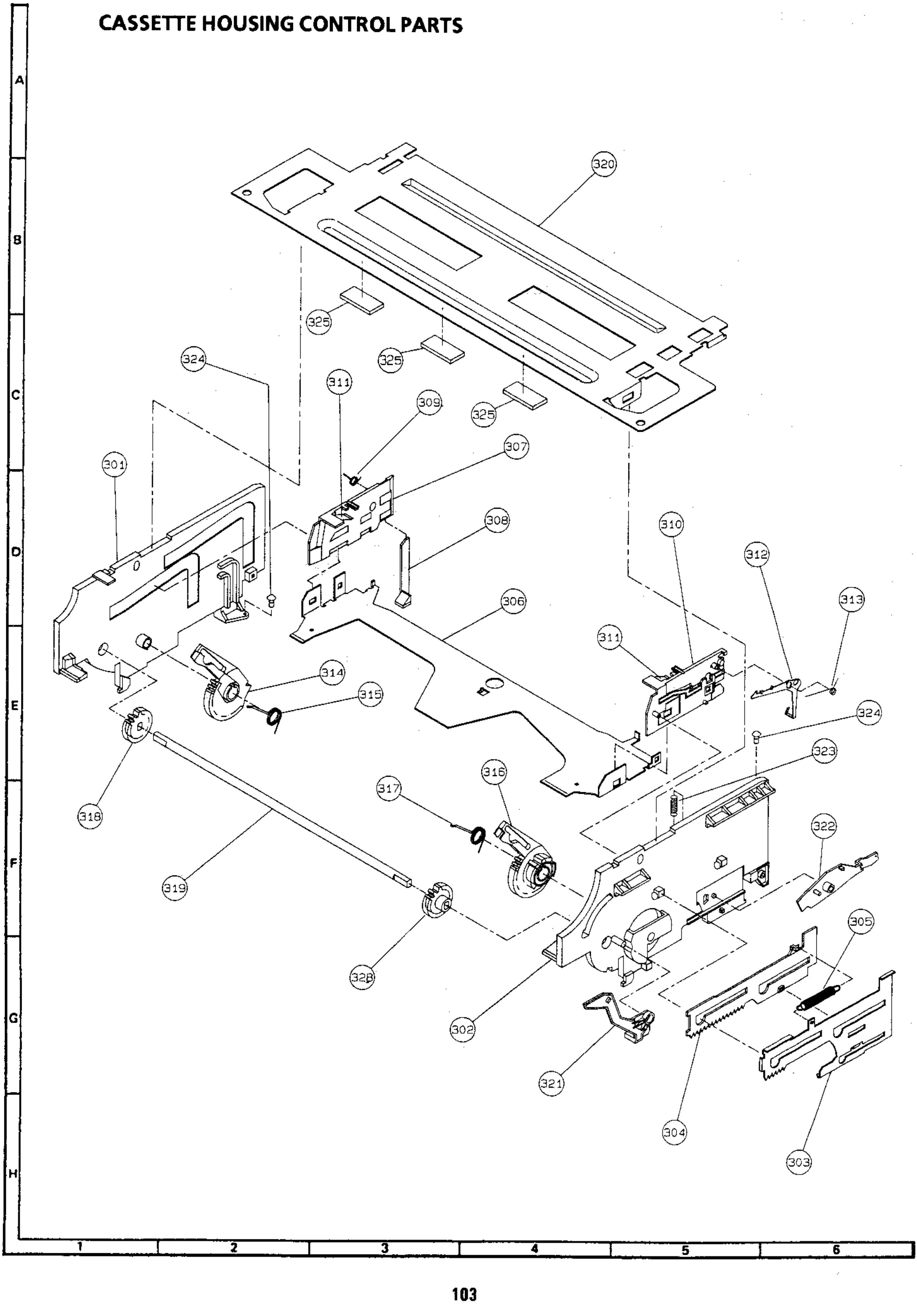
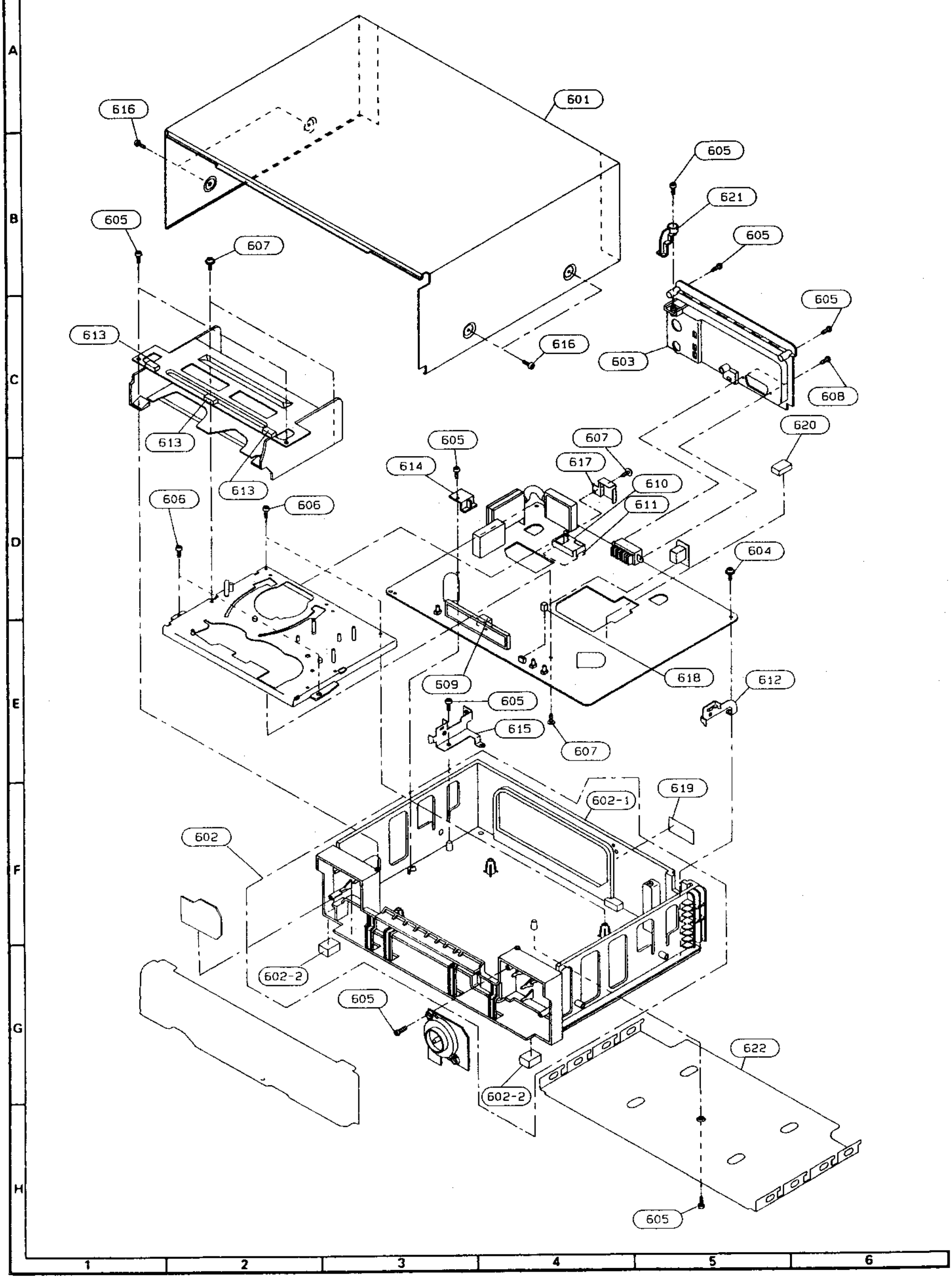
38
63
65
219
219
53
37
206
206
222
33
39
51
52
223
224
225
226
227
228
61
208
20
221
221

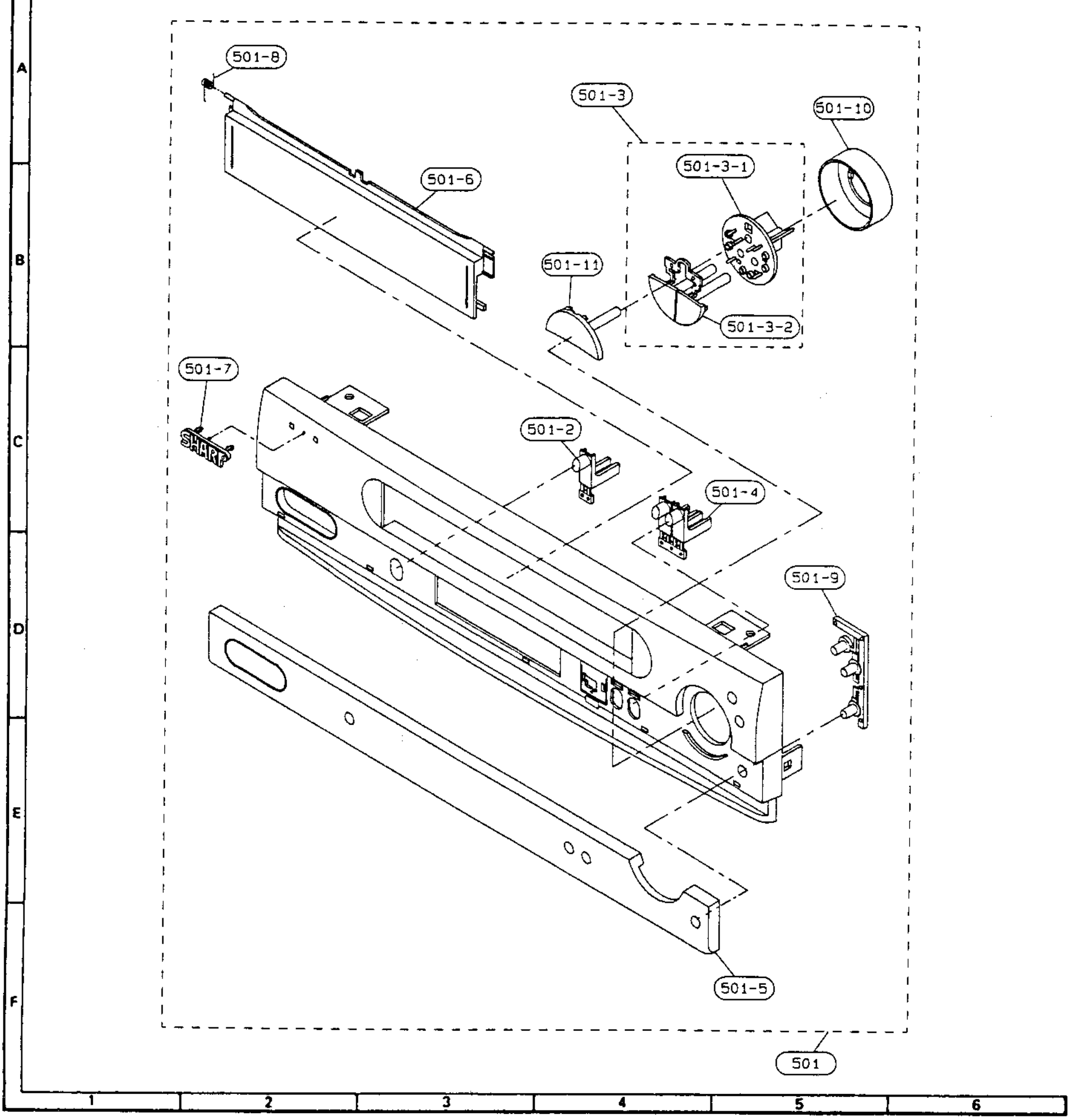
CASSETTE HOUSING CONTROL PARTS


A
B
C
D
E
F
G
H
1
2
3
4
5
6
320
325
325
325
324
311
309
307
301
308
310
312
313
306
311
314
315
324
323
316
317
318
322
319
305
328
302
321
304
303

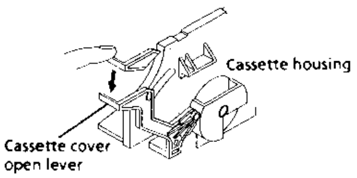
MECHANICAL PARTS


A
B
C
D
E
F
G
H
616
601
605
621
605
607
605
613
616
603
608
613
613
620
605
607
614
617
610
606
606
611
604
609
618
612
605
615
607
602-1
619
602
602-2
605
602-2
622
605
1
2
3
4
5
6

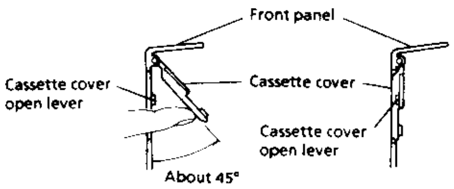
FRONT PANEL PARTS


A
B
C
D
E
F
501-8
501-3
501-10
501-3-1
501-6
501-11
501-3-2
501-7
501-2
501-4
501-9
501-5
501
1
2
3
4
5
6

PRECAUTIONS ON FRONT PANEL SET-UP

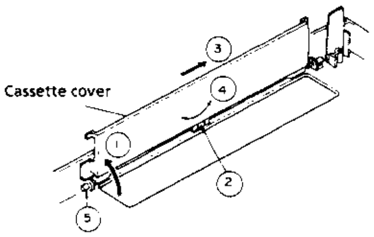

Cassette housing
Cassette cover
open lever

Before attaching the front panel in position, make sure that the cassette cover open lever is in its right place (lowermost). If it is out of position, push it down with a finger.


Front panel
Cassette cover
open lever
Cassette cover
Cassette cover
open lever
About 45°

Keep the cassette over about 45° open and make sure that the cassette cover open lever is between the front panel and the cassette cover. Now fix the front panel in place.

Do not mount the front panel with the cassette cover tilted too open. Otherwise the cassette cover might wrongly run on the cassette housing.


Cassette cover
①
②
③
④
⑤

Removing the cassette compartment cover.
① Open the cassette compartment cover fully.
② Remove the center positioner.
③ Slide the cover to the right.
④ Slightly bend the cover.
⑤ Draw out the left-side rod.

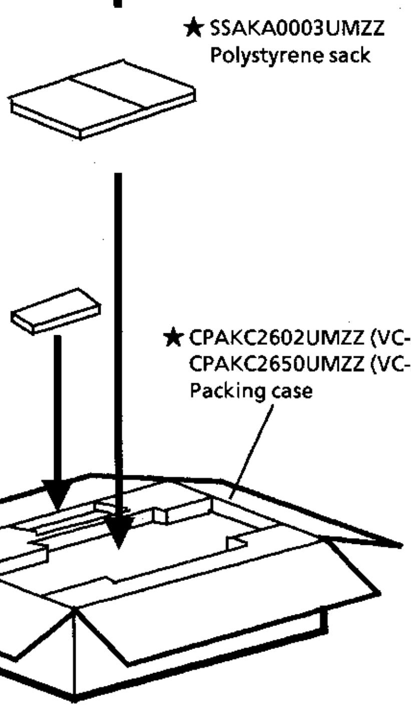
12. PACKING OF THE SET

• Setting position of the Knobs

RF Converter Adjuster	at "E36" position	Test Signal Switch	at "OFF" position

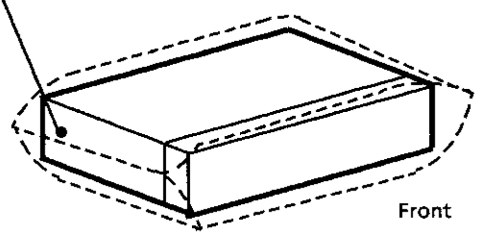
★ Accessories

★TGAN-3135UMZZ	Resistration card (VC-A72HM)
★TiNS-2372UMZZ	Operation manual (VC-A72HM)
★TiNS-2438UMZZ	Operation manual (VC-A72LM)
★TiNS-2411UMZZ	Quick Set-up guide card (VC-A72HM)
★QCNW-7544UMZZ	75 ohm coaxial cable
	Battery

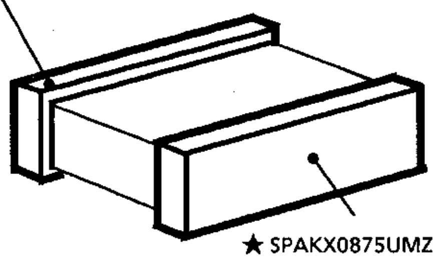

★ SSAKA0003UMZZ
Polystyrene sack

RRMCG0013AJSA
Infrared remote control unit

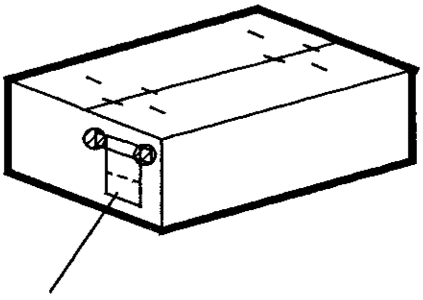
★ CPAKC2602UMZZ (VC-A72HM)
CPAKC2650UMZZ (VC-A72LM)
Packing case



★ SPAKP0051UMZZ
Polystyrene sack


★ SPAKX0874UMZZ
Buffer material (rear)

★ SPAKX0875UMZZ
Buffer material (front)


★ TLABK0001UMZZ
No. card

★ Not Replacement Items

T9614-S
Printed in Japan